Transferability of e-Portfolios in Education

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There has been very little documented research on the impact and influence of e-portfolios on teacher training in Higher Education Institutions. However, with those institutions who have adopted e-portfolios claiming "they are the biggest educational technology development since the adoption of Course Management Systems" (Lorenzo & Ittleson, 2005a), it is easy to understand why the term e-portfolio is becoming so popular. With bodies such as the Department for Education and Skills (DfES) aiming to provide e-portfolios for schools by 2007 more documented research is required in the area of Teacher Training and e-portfolios (DfES 2005). Consequently, if the DfES achieves its aim to provide students with a personal learning space with the possibility to facilitate e-portfolios in colleges across the UK by 2007-08, it is fundamental that the implementation of e-portfolios into education is reviewed accordingly (Roberts et al., 2005).

The introduction of portfolios into Teacher Training is not a new phenomenon. Reflective journals in teacher education, which were in many ways the precursor to portfolios, have been widely used to promote learning. Sinclair & Woodward (1997) found that reflective journals enabled students to make connections between theory and practice and to critically evaluate their own performance as teachers. Clarke (2004) emphasised that one of the benefits of the use of reflection in teacher education includes providing evidence of professional learning. Scribner (1998) identified that it is imperative for teachers in the beginning of their career to "be autonomous learners with a deep commitment to continued professional growth and development". Loughran and Corrigan (1995) summarise the main benefit of a teaching portfolio as encompassing "learning about one's own learning and teaching and understanding how that might influence their approach to the students they will teach." Teaching students how to be reflective about their practice will teach skills which they can take forward into the workplace.

MacIssac & Jackson (1995) define a portfolio as "the structured documented history of a carefully selected set of coached or mentored accomplishments substantiated by samples of a learners work and fully realized only through reflective writing, deliberation, and serious conversation." This definition highlights the core themes of reflection and process which are embedded within portfolios..a concept further supported by Winsor and Ellefson (1995) who define portfolios as "a fusion of processes and product.... the process of reflection, selection, rationalization, and evaluation, together with [the] product of those processes." Wolf (1991) refers to the dynamic assessment of portfolios and states that a portfolio is "more than a container – a portfolio also embodies an attitude that assessment is dynamic and that the richest portrayals of teacher (and student) performance are based on multiple sources of evidence collected over time in authentic settings."

A number of limitations have been identified with the traditional paper based portfolio format. The literature has highlighted the space required to store the portfolios of x amount of students – in practical terms they are cumbersome for both staff and student. Due to the authentic nature of portfolios further complications arise when portfolios are being passed from one staff member to another to be marked which could lead to the possibility of students work becoming lost or mixed up. Other limiting factors include access to the contents of the portfolio. Wagner (1998) illustrates the implications with the assessment of the traditional portfolio model and states the importance of a portfolio having a content and structure which is easy for the assessor to follow. For students in teacher training it is likely that they would include recordings of their teaching in action by means of video, DVD, or tape recordings. Obviously, this is not only further bulk to include but more importantly the markers then require access to a video player, DVD player etc. This not only imposes time issues to review a portfolio but also compromises the fluidity of the material in the portfolio and hinders the capability for students to show understanding of the links between those materials. The final consideration with the traditional style portfolio model includes the transferability of the artefacts within a portfolio from a learning portfolio to a showcase portfolio for employment purposes and further as a tool to support PDP once the teacher is in the workplace.

There have been a number of definitions of e-portfolios:

> 'e-Portfolios ….are personal online spaces for students to access services and store work. They will become ever more useful as learners grow up and start moving between different types of learning and different institutions' (Secretary of State for Education and Skills, January 2006).

The Joint Information Systems Committee (JISC) has been actively supporting projects in the area of e-portfolios and education through four categories which include; presentation, transition, learning and technical development. This gives a wider interpretation of e-portfolios:

> 'e-Portfolio can be used to refer to a **system** or a collection of tools that support e-portfolio related **processes** (such as collection, reflection, annotation, etc.). The term 'e-Portfolio' can also refer to the **products** emerging through these systems or tools, and it is helpful to think about the purposes to which learners might put their e-portfolios (for example presentation for assessment, to support transition, or to support and guide learning)' (JISC overview paper).

Lorenzo and Ittleson (2005) define an e-portfolio as:

> 'a digitized collection of artifacts, including demonstrations, resources, and accomplishments that represent an individual, group, community, organization, or institution. This collection can be comprised of text-based, graphic, or multimedia elements archived on a Website or on other electronic media such as CD-Rom or DVD'.

Barrett's (2006) definition of an e-portfolio focuses on the process of creating an e-portfolio and includes "a collection of work that a learner has collected, selected, organized, reflected upon, and presented to show understanding and growth over time", while Richardson & Ward, (2005) view the introduction of e-portfolio practice in the UK "as evolving largely from PDP practice". However, in its simplest form an e-portfolio is a collection of artefacts which can be used to demonstrate knowledge, reflection, and learning.

The DfES has recognised that there is an issue of transferability which can, and must, be addressed before an e-portfolio can be utilised regardless of the constrictions of time and space:

> 'we will have to re-engineer the data so that wherever you are in the education system the individual learner can demonstrate to another institution, an employer, or to a parent, what they have done, how they are succeeding and who they are' (Director of DfES Communications Directorate, January 2006).

Furthermore, Weller (2005) states 'if e-portfolios are adopted in the manner that many predict, then being able to swap data between systems (e.g. work-based and university based) will be essential, so this is an area that is in definite need of a standard'. Jafari (2004) supports this and argues that the transportability of e-portfolios should be immediate and effortless. However, without thorough consideration at implementation stage e-portfolios are at risk of being a tool that fails to reach its hype.

However, as we have seen above, one size does not fit all and within higher education e-portfolios are now being asked to perform an ever widening range of functions. As the uses differ, so to does the required content – components designed to encourage reflective learning do not necessarily lend themselves automatically to inclusion within an employment focused portfolio. Mosely identified three distinct needs from portfolios: a 'learning portfolio' for student engagement and reflective learning, a 'credential portfolio' to demonstrate proficiency and progress, and a 'showcase portfolio' for job search and employment (Mosely 2005). e-Portfolios progress through two distinct stages, in the process having to fulfil a number of separate functions which correspond with Mosely's identified needs. The first stage is that of the learner while the second is that of the practitioner. In the first stage the portfolio has the functions of assessment, reflective learning and, more recently, as a job search tool while in the second it promotes longitudinal development of experiential learning. These two stages are defined by Sunal et al as 'process', the interaction between learner and teacher as the work is documented, and 'product', demonstrating practitioner knowledge (Sunal et al, 2005).

Greenberg (2004) also identifies three different types of e-portfolios which he refers to as Showcase, Structured, and Learning. As the name suggests the showcase portfolio is primarily designed to showcase the learner's best work and specific experience, for example job interviews. The structure of a

showcase e-portfolio takes place after the artefacts have been uploaded into the e-portfolio, and is structured according to how the artefacts are represented best visually and ease of navigation. The structured e-portfolio has a predetermined structure which is designed to instruct students on the predefined learning objectives. Consequently, the standardised nature of these e-portfolios makes it easier for instructors to evaluate and review. The learning e-portfolio is a dynamic approach to e-portfolios, there is no predetermined structure and the structure evolves throughout the process of creating it. It is designed to be fluid and forever evolving in parallel with the learner's interests and experiences.

Similarly, IMS (2005) outlined 6 types of identifiable e-portfolios. Assessment e-portfolios which follow a similar structure to the 'structured e-portfolios' Greenberg identified above; Presentation e-portfolios which is primarily another term for showcase portfolios; Learning e-portfolios, as above; Personal development e-portfolios which are structure to specifically fulfil PDP guidelines and are predominantly reflection based; Multiple owner e-portfolios, which, as the name suggests, are intended to benefit learners collaborating in groups; and, Working e-portfolios which are a combination of all of the above and are designed to include multiple views.

The components included in an e-portfolio are specific to the learning objectives and consequently have a purpose for being included. Siemens (2004) identifies the following as typical components of an e-portfolio.

i. Personal information
ii. Education history
iii. Recognition – awards and certificates
iv. Reflective comments
v. Coursework – assignment, projects
vi. Instructor comments
vii. Previous employer comments
viii. Goals, plans
ix. Personal values and interests
x. Presentations, papers
xi. Personal activities – volunteer work, professional development

Limitations evident in traditional portfolios can be reviewed using e-portfolios. Firstly, because e-portfolios can be networked on an institutional system, students and teachers alike can access the portfolios to review, update and provide feedback. e-Portfolios allow students to 're-work' the material in their e-portfolio to provide more meaning to it (Mason et al. 2004). Furthermore, because of the nature of e-portfolios, students can include short video clips, sound bites and links to relevant material within the e-portfolio to describe their best practice (Barrett, 2006). Subsequently, the flexibility allows the student to make links between their media clips and reflections, allowing clearer connections between the two and consequently showcasing the learning taking place. Finally, the potential of e-portfolios as a lifelong learning tool is apparent and yet to be unleashed. The concept of e-portfolios allows the learner to maintain their e-portfolios and transfer it with them into their

different life stages. Lorenzo and Ittleson (2005a) emphasis the importance of an e-portfolio to be transferable because as "students transfer from institution to institution during their educational careers, the ability to transport their e-portfolios into new systems becomes increasingly important." This capability would encourage a generation of lifelong learners (Siemens, 2004, Greenberg, 2004, Meeus et al., 2006).

Unlike traditional paper based assignments e-portfolios are not limited to showcasing best work (Barrett, 2006). With the appropriate design setup the e-portfolio can be a networked space allowing discussion and reflection by all users, encouraging interconnected feedback by peers, mentors, teachers etc. Interestingly, Clark, Topp and Goeman (2002) noted the use of e-portfolios for students to document their reflections while on placement provided more opportunity for rapid feedback from staff. Mason et al. (2004) identified networked e-portfolios as an opportunity for students to engage in collaborative learning with the opportunity to utilise their peers and work together. This dynamic approach allows the learner to incorporate materials such as the Web, DVD's and Cd's into the portfolio which as a consequence allows the students to incorporate many different media types as evidence of achieving the learning objectives (Barrett, 2006, Abrami & Barrett, 2005, Whitsed, 2005). Cunningham and Benedetto (2002), investigating incorporating these technologies to support reflective practice into teacher training, found that the implications with implementation largely surrounded the technology itself, which they felt required substantial planning and research in order to successfully integrate into the curriculum.

The flexibility inherent within the e-portfolio process was highlighted by Ingram (2006) as one of the main strengths of implementing e-portfolios as students had the opportunity to become involved wherever they chose with no limitation from being on campus.

Integrating e-portfolios into teacher education allows students to develop their technology skills as well as showcase their experience gained while training (Grier, 2002, Dawson, 2006). The electronic portfolio represents a means to demonstrate the teaching skills and values of the learner and when used by practitioners it demonstrates the continuing professional development of the qualified practitioner.

> '*it's compelling educational advantage is it's capability to support reflective text-based interaction, independent of the pressures of time and the constraints of distance*' (e-learning in the 21st century).

Consequently e-portfolios are a tool capable of supporting lifelong learning through CPD and PDP and are not restricted to periods of higher education (Mason et al., 2004). The process of developing an e-portfolio in itself teaches skills to further facilitate lifelong learning (Love and Cooper, 2004; Jafari, 2004, Richardson & Ward, 2005, Mason et al., 2004). This is also recognised by JISC who observe that:

'an important aspect of lifelong learning is the learners' ability to assemble, demonstrate and reflect on the skills, knowledge and achievement they have built up during their unique learning journeys. One of the functions of electronic portfolios (e-portfolios) is to support this kind of activity' (JISC 2006).

Foti (2002) advocates that the "construction of an electronic teaching portfolio forces students to continuously construct and revisit their knowledge, beliefs and biases about the profession". Similarly, Bhattacharya (2002) concludes that through the process of designing a meaningful learning environment (MLE) student teachers developed different technology skills which promoted lifelong learning. This suggests that creating an e-portfolio "may be a useful approach for fostering authentic professional development" (Milman & Kilbane, 2005).

E-portfolios provide the learners with an opportunity to select artifacts and assess their own learning by focusing on the process involved (Strudler & Wetzel, 2005). Barrett (2006) further advises that the 'artifacts' provide an essential element of the e-portfolio. The artefacts include the "learners reflection on individual pieces of work as well as the overall reflection on the story that the portfolio tells" (Barrett, 2006). Lorenzo and Ittleson (2005a) support this and list the key benefits as including: document training, skills and accomplishments, and encouraging teachers to be reflective about their teaching. Bhattachara (2002) recognises that students "become skilled at self-evaluation by developing electronic portfolios" while Wade et al. (2005) extend upon this and state "electronic portfolios may provide additional means to scaffold teachers and students in the portfolio process and better encourage self-regulation."

Via reflective learning, e-portfolios offer the opportunity for learners to consider the work inside their portfolio which can help the learner to "create a meaningful learning experience" (Lorenzo & Ittleson, 2005a). Wade & Yarbrough (1996) see teaching portfolios as providing a "connective process" by giving the students the opportunity to step back from their learning and reflect. The social network of an online e-portfolio allows learners to digest feedback received, alter work accordingly, and resubmit their work for further review (Ahn, 2004). This encourages students to think critically about their work and develop fundamental writing and IT skills (Lorenzo & Ittleson, 2005a). This process is what Acker (2005) refers to as the '3rs' including "representation, reflection, and revision". Giving the opportunity for students to redeem their work based on feedback they have received means the construction of their knowledge, and the learning process, can be viewed as spiralling upwards rather than the traditional linear model. See diagram 1 below.
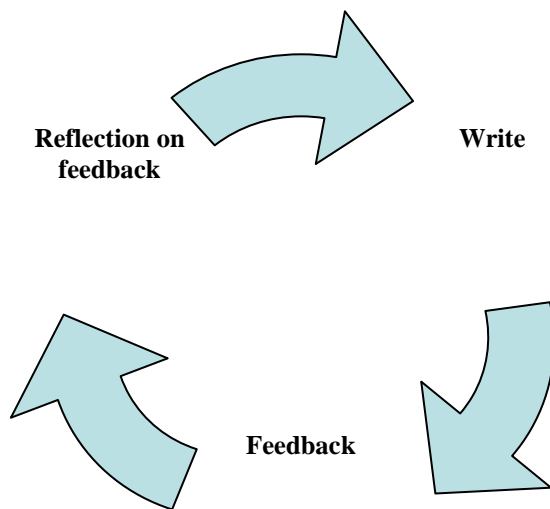
Diagram 1: Reflective Cycle

This reflective style of learning encourages learners to engage in the process of, and in turn map, their own learning (Wolf, 1994). Levin and Camp (2002) feel the introduction of e-portfolios has developed students reflective practice skills while providing the training for these skills has helped students develop into reflective practitioners. The process of developing an e-portfolio further encourages students whose written language is less developed to have an opportunity to develop their written evidence (Whitsed, 2005). Milman and Kilbane (2005) further reflect that "teachers need to participate in professional development that requires teachers to explore, discover, discuss, and construct new meaning."

Brown (2002) investigated the perspective of students "on the learning that resulted from their creation of an experiential learning portfolio". Brown attained 3 major findings. These included:
- Increase in participants' "self knowledge"
- Greater appreciation of the value of e-portfolios through work and mentors
- Development of organisation and communication skills

Amber and Czech (2002) found pre service teachers felt that the process of creating an e-portfolio improved their ability to improve teaching practices, particularly becoming a reflective practitioner. Furthermore they found that student teachers felt themselves to be more employable for having developed an e-portfolio as it demonstrates their proficiency using technology.

e-Portfolios present the learner/practitioner with the capacity to act quickly on their reflections by offering the ability and flexibility to adapt and restructure and by offering a range of technical tools to use both in reflective analysis and the presentation of skills development. The learner/practitioner is therefore provided with the opportunity for 'constant' reflection rather than the 'periodic' reflection offered by more traditional paper-based portfolios. In this fashion there is the opportunity for continual improvement. (Adcock 2005). The

reflective capabilities of e-portfolios has been demonstrated through a two year pilot study (Hall and Weimer 2004) and it is increasingly evident that teacher values can be more strongly expressed in electronic format than traditional paper format. In a recent study on teaching values in pre-service teachers e-portfolios, Sunal et al argue that the use of e-portfolios promotes a greater impetus for the user to assume personal responsibility for their development, in the process taking a greater degree of individual control over their progression towards becoming a teacher.

Roberts et al. (2005) pose the question "should reflection be assessed?" This is an example of the conflict found between focusing on a process-focussed approach and a product-focussed approach. However, Zeichner and Liston (1996) identify that reflection on its own may not necessarily benefit the learner and may not impact on the quality of teacher the learner becomes. The lack of understanding by students of the learning objectives of an e-portfolio can hinder their success. Darling (2001) states that the flexible approach to structure of the portfolio caused anxiety in some students as they had a sense of 'helplessness' by not knowing where or how to start. This was supported by Wade and Yarbrough (1996) who also found that this anxiety of developing a traditional paper based portfolio also existed with the introduction of teaching portfolios and was not viewed as a success for all students. Carney (2002) found students who developed traditional portfolios were also anxious about the prospective audience and consequently avoided including personal reflections in their portfolio, a factor which hindered the student's ability to develop their reflective thinking skills. Carney acknowledged that students using e-portfolios were also nervous of publishing personal reflections on the web, in turn inhibiting their professional teaching knowledge that they were willing to share with their peers. In order to overcome this anxiety there might be the creation of a learning space where specific artefacts can be chosen to be showcased and personal items can remain just that.

Loughran and Corrigan (1995) argue that the use of teaching portfolios in teacher education helps "bridge the gap" between performance and learning therefore creating a realistic learning environment. e-Portfolios could potentially connect individuals work and standards based assessment (Ahn, 2004). Wagner (1998) proposed that "as an assessment tool the portfolios has much to offer in terms of involving students in the assessment process and in documenting their achievements" with Whitsed (2005) concluding that e-portfolios are an assessment tool "which empowers the learner" because it develops reflective learning and independent thought.

e-Portfolios provide an assessment environment which incorporates a learner driven process which can afford a more authentic picture of the learning taking place. Traditional portfolios allow the learner to include numerous different types of evidence to be assessed which subsequently allows the reader/evaluator to draw on a variety of artefacts to assess the learning taking place. Love and Cooper (2004) acknowledge this, in turn viewing portfolios as a form of evidence based assessment which focuses on application of knowledge rather than the 'knowing' of knowledge. However, further

implications arise with assessment when students randomly include everything in their portfolio rather selectively presenting the process of how their learning took place (Wagner, 1998). Furthermore, Greenberg (2004) reflects on the authenticity of assessment of the learning process which e-portfolios can provide in comparison to traditional assessment methods. Due to the concerns expressed by Darling (2001) when assessing students portfolios, the students were encouraged to submit their portfolios for review from both instructors and peers before the deadline.

Love and Cooper (2004) consider the problematic issues affecting "core pedagogical and assessment design" as either ignored or overshadowed by the software itself. Zeichner and Wray (2001) support this and explain that it is easy for students to get caught up in the attractiveness of their portfolio rather than the work itself. This is one of the many issues which need to be fully considered when implementing e-portfolios into the curriculum.

In order to successfully assess a student's e-portfolio a diverse approach incorporating various strategies needs to be considered as assessing a vast array of artifacts which contain many different 'learning strategies' has proved to be problematic. e-Portfolios are not rigid enough in structure in order to standardise individual students learning processes. If e-portfolios were standardised to make this a possibility they might lose the overall essence of focus which is the learning process. Siemens (2004) claims that "e-portfolios will be successful if the urge to excessively standardize is resisted". Darling (2001) concurs with this and further adds that it is "the process not the product that may reveal the most about who they are as emerging teachers". Even if agreement occurred on the assessment of reflection – how does one quantify a student's reflection into the amount of learning taking place? Darling (2001) decided to evaluate student's portfolios in terms of 'excellent, good, fair and unacceptable' grading system by including the following five categories:

- Coherence and Cohesiveness
- Comprehensiveness
- Clarity
- Creativity
- Communication Potential

A further potential trap with teaching portfolios, identified by Loughran and Corrigan (1995), is the inclusion of single individual items into the portfolio which does not convey the actual meaning of the portfolio. This is especially relevant to e-portfolios which, without identifying the right learning outcomes to the students, would be difficult to evaluate and could easily become little more than a content management system.

Although Wagner (1998) found that teachers preferred to mark portfolios using marking guides, consideration needs to take place on developing and implementing structured marking guidelines to reflect on the unique nature of e-portfolios. Zeichner and Wray (2001) identify how some programmes use Rubrics to assess the portfolios whether online or paper based a process supported by Bhattacharya (2002) who found that using rubrics to evaluate

student teacher reflections provided structure and by Tosh et al (2005) who feel rubrics provide the structure required by students in order to learn how to reflect on their learning.

Portfolios/e-portfolios have been used to showcase student's practical skills in job interviews as evidence of their experience. For student teachers, taking their portfolios to a job interview provides an opportunity for the employer to gain some perspective and insight of the teaching experience the candidate gained while in training. However, Mosely (2004) found that 86.4% of employers surveyed found portfolios (not e-portfolios) to be too unstructured to be reviewed during the decision process. A further 63.6% found it too time consuming to review portfolios during the decision process and a further 63.6% found that portfolios contained excessive information which deterred them from reviewing the portfolio. These findings illustrate the design complexities which need to be considered and addressed with reference to what the potential employer would like to see as evidence of best practice and emphasise the importance of visual design of e-portfolios to benefit the prospective employer. Two vital design characteristics are highlighted here including structure and amount of material made available. e-Portfolios provide the students with the opportunity to select some artefacts as their showcase portfolios while saving other material for their personal learning portfolio.

Mosely (2004) assesses reasons why potential employers like to use portfolios as a means of assessment of interviewees with 81.1% of the cohort feeling portfolios provide a great deal of information about the potential candidates and 74.8% feeling portfolios provide a greater depth of information not otherwise available to the potential employer. However, there is limited literature available on the use of student e-portfolios to gain employment although, evidently from Mosely's study, a showcase e-portfolio should be structured, brief and concise in order for it to be effective to the employer.

Much has been written about the considerations which need to be made in the earlier planning stages of implementing e-portfolios. However, as Challis (2005) concludes, making decisions about the implementation of e-portfolios into higher education "is not adequately supported by research." Wetzel & Strudler (2005) concur and add that more research is required in the area of implementing e-portfolios into teacher training. At this stage implementation of e-portfolios into higher education is currently being reviewed as not reaching its full potential (Love & Cooper, 2004). Darling (2001) feels that portfolios have a place in teacher education but important issues need to be addressed in order to guarantee success while Jafari (2004) acknowledges that the current electronic resources within higher education do not offer the flexibility which is required for a successful e-portfolio. In order to support personal development the e-portfolio system needs to allow flexibility so that students can create multiple views appropriate to each particular purpose (Tosh et al., 2005). This flexibility needs to allow "students to develop their own mental model of how they wish to organize their" e-portfolio (Brown, 2002). Barrett (2006) identifies that for e-portfolios to be successful the e-portfolio needs to be flexible so that the students can "express their own voice and leave their

own mark in their portfolios". Possible tools to encourage students to do this include blogging, podcasting, multimedia artefacts, and digital storytelling.

The race to implement e-portfolios into higher education has meant the ultimate effectiveness of e-portfolios has been to some extent ignored as e-portfolios are not currently student centred but assessment driven (Ayala, 2006). Hauge (2006) investigates how portfolios can lend themselves to improve understanding of teaching and learning practice, therefore bridging the gap between theory and practice. The key implication of successful integration of e-portfolios is reflected in the integration process where many considerations need to take place.

The development of a successful e-portfolio resource requires a consensus between all parties involved in the development of an e-portfolio package to consider and agree upon the objectives of the e-portfolio prior to design and implementation (Johnson & DiBiase, 2004, Tosh et al., 2005). Wade et al. (2005) feel the decision to incorporate e-portfolios needs to be institute wide. This means also considering how to "support staff professional development" while integrating e-portfolios (Brown, 2002). Without this e-portfolios are at risk of becoming "a new vehicle used to perform an old task, with the result that portfolios will become standardized-with common assignments and restrictive learning conditions" (Yancey, 2006).

Love and Cooper (2004) identify 4 common weaknesses in the design of e-portfolios. These include:

1. Focus remains solely on technical side rather than administrative side;
2. e-portfolio is used as a content management system rather than an interactive learning tool;
3. The stakeholder's views or needs are not included in the development of an e-portfolio;
4. e-portfolio is not fully integrated into the curriculum.

Failing to include all parties involved in creating this consensus will impact on how users may respond if implementation of e-portfolios is not planned accordingly. This includes a lack of support for the change due to a lack of explanation of the goals and motivation behind the change in the first place. Tosh et al. (2005) added that "students have to know what an e-portfolio is, how to use one and, most importantly, how it may benefit them in order for the project to succeed". The benefit of having an e-portfolio running on the networked system allows constant reflection on artifacts by users, peers and teachers (Love, McKean and Gathercoal, 2004).

In order for e-portfolios to lend themselves as a lifelong learning tool Siemens (2004) feels it is imperative for students to be in control of selecting their own e-portfolio software from an approved list of options supplied by the institution which they can use and later take with them into their employment. Whitsed (2005) also encourages the portable and transferable nature of e-portfolios to allow the learner to take their e-portfolio with them between employers and learning episodes. This would give learners personal control of their learning

and allow individuals to be involved in the process. However, as Strivens (2007) found "interoperability in terms of inter-institutional transfer is not yet a high priority" in the UK. Consideration needs to take place, due to anxieties which may be raised from the students, about the necessary IT skills for developing an e-portfolio (Ingram, 2006). Carliner (2005) suggests a possible method to address student's anxieties about IT capabilities is to incorporate different levels of templates to suit different user's abilities.

Many authors identify the key issues which are critical in the implementation of e-portfolios into higher education (Love and Cooper, 2004, Lorenzo and Ittleson, 2005, Roberts et al, 2005, Jafari, 2004). Lorenzo & Ittleson (2005a) identify seven main implementation issues which need to be considered when exploring the opportunity to implement an e-portfolio. These include:

1. Hardware and software – what type of hardware or software will be used to develop and maintain the e-portfolios?
2. Support and scalability – Is there enough room for the project to develop and expand with time?
3. Security and Privacy – What are the rights of the students for displaying their e-portfolio?
4. Ownership and Intellectual Property – Who owns the e-portfolio?
5. Assessment – Is it an assessment tool? If so how is it assessed? Should reflection be assessed?
6. Adoption – Is there sufficient support from administration and other stake holders?
7. Long-term maintenance – Who is responsible for maintaining the system?

Likewise, Jafari (2004) offers a model for a "Successful e-Portfolio Project"; this model includes 7 factors which need to be addressed in order to successfully implement an e-portfolio model into a HEI. The seven factors include:

- Ease of Use
- Sustainable business plan
- Advanced features
- Robust integrated Technology Architecture
- Lifelong Support
- Standards and transportability
- Miscellaneous

Roberts et al (2005) similar identified the following five issues as critical:

1. define goals
2. observe perspectives of multiple stakeholders
3. communicate with all stakeholders during the development process
4. support from both 'managerial' and 'functional' members of the institution
5. integrate technologies

It is evident that the common concerns of the authors of implementation include the speed at which departments want e-portfolios to take place. Ayala (2006) suggests a step back needs to be taken to reflect on the true needs of the students and therefore the requirements of the e-portfolio acknowledged accordingly. Wetzel & Strudler (2005) reflect on the sustainability of e-portfolios and the importance of ensuring the implementation process is manageable long term as well as short term. Interestingly, it was considering these student needs which lead to Darling (2001) noting that the initial reactions from students about the prospect of doing a portfolio included some levels of anxiety due to the undefined nature of the task.

Ultimately the success of implementation of e-portfolios is limited to how involved learners themselves feel in the process. They themselves need to recognise the benefits and value of developing an e-portfolio for themselves (Siemens, 2004), including developing a clear understanding of the technology. To this end it is important that time is dedicated to the training of staff and students in the use of the technology (Hall et al, 2005). In order for e-portfolios to be successfully implanted into the course programme they need to be fully embedded into the curriculum (Challis, 2005). Furthermore, the transferability of a teaching portfolio whether it is electronic or paper based has caused friction between learners and instructors. While learners are interested in how the portfolio will help them gain employment, instructors are interested in promoting the learners professional development (Zeichner and Wray, 2001). There is an ongoing need to clearly identify the purpose behind utilising e-portfolios within the curriculum and what this might mean for the development of learning and teaching.

The implications of e-portfolios in teacher education can be reviewed and overcome accordingly;

> *"Matching the philosophical orientation with e-portfolio tools should reduce the cognitive dissonance and conflicting goals between learners' needs and institutional requirements. The result should be support for deep, sustainable, self-directed, lifelong learning."*
>
> Barrett & Wilkerson (2004)

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