Reflection
The AAEEBL ePortfolio Review (AePR) is the tri-annual magazine of the Association for Authentic, Experiential and Evidence-Based Learning. The AePR is an online journal serving the needs of the global eportfolio community and seeks to promote portfolio learning as a major way to transform higher education.

AePR is sent to AAEEBL members, partner representatives, eportfolio practitioners, administrators, and students. It covers the broad area of eportfolio use including: pedagogy, research (AePR is not a double blind peer-reviewed research journal), technical (including articles about technology), and/or organizational issues.

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Welcome readers,

As promised in the welcome to the inaugural issue of the AAEEBL ePortfolio Review, this issue is focused on an important topic for the practice of and research on eportfolios and their value for student learning, faculty pedagogy and institutional development. Reflection is the focus of the authors in this issue. Reflection is one of the central strengths of the eportfolio approach to teaching and learning. Reflection is fundamental for students to develop the capacity and the habit of mind to actively think about what and how they are learning, their strengths and their areas for improvement, the relationships between formal, non-formal and informal learning connected to courses and activities and the rest of their lives before, during and after they are no longer in school. In other words, it is critical for making sense and meaning in students’ lives and in relation to who they are and who they want to become.

In this issue, the reader is presented with a case study from a student’s perspective that illustrates how reflection can serve as a means to develop higher order learning abilities and assessment of capabilities. Others explore how reflection can help build a culture of reflective practice throughout an institution with many unanticipated benefits. Habits of mind become the focus of other writers for life-long learning and for graduate students preparing for careers as educators and practicing professionals. More than one article reiterates the importance of assignments for learning. Through examining the integrative and reflective possibilities of the digital eportfolio technology, multimedia can expand the ability to capture and to demonstrate learning as well as the metacognitive abilities that meld portfolio thinking into individual identity and agency.

The reader will delve into a broad experience of the multitude of ways in which eportfolios are transforming learning for deeper, life changing effect for students, faculty and institutions from the U.S. and Canada to South Africa and Australia. Already, issue #2 of AePR is lifting up and sharing the good work of the educators around the globe as eportfolios continue to illustrate why they have recently been added to the list of high impact, highly effective practices for learning.

Welcome to Issue #2.

Enjoy!

Terrel Rhodes
AAC&U and the AAEEBL Board of Directors
Dear readers,

In preparing this issue over the first few months of the year, we had the time to reflect on the past year and the publication of AePR. When we were first asked to serve as Co-Executive Editor’s by AEEBL’s Founder Trent Batson, our only desire was to create a publication worthy of such an esteemed organization. The full Editorial Board spent most of 2016 in solitude, quietly putting together the framework for our first issue. During this process, we spent more time reflecting and critiquing what we were doing as much as we did designing the layout and collecting, reviewing and editing the articles. Though our initial publication was delayed by a couple of months, I believe it was well worth the wait and judging by the reaction so did our readers. We cannot thank you enough for the warm reception and instantaneous response for future issues.

This past Fall was also a time of deep personal and societal tension for those of us here in the U.S., as we dealt with what we felt was an upheaval of our political process. Regardless of what side of the aisle you might have been on, the experience and process left many of us at a loss of how to move forward. We each had to contemplate on what truly bothered us and begin to rebuild our paths forward. For some, this meant political action, for others it was community service, and others isolation. Whatever the case might be, we each dealt with the internal turmoil individually but reunited and now move forward as one people. We have seen this same process repeated around the globe, with all of us considering how we can make the world a better place than it is now.

Therefore, it seems fitting that our first issue of 2017 focuses on reflective practices within ePortfolios. In the use of ePortfolio, reflection allows the learner to further contemplate past events and tie them to current activities and acts to broaden the learning environment. To begin this issue, we asked each author to submit their definition of reflection. While each is similar, there are nuances among them and this demonstrates how our own understanding of reflection takes many shapes. We hope this prompts you to reflect on your use of reflection and how it has changed over the years.

Happy reading,

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Definitions: Reflection

**Helen L. Chen and Sheetal J. Patel**

Our definition of reflection is drawn from the context of supporting graduate students who are creating professional portfolios. This reflective process is both interactive and iterative, where students leverage digital evidence and storytelling strategies to create a self-narrative for a specific audience and purpose. During our program, students meet with a variety of ePortfolio stakeholders including peers, advisors, faculty, career counselors, employers, and alumni. These interactions often prompt self-reflection as the student considers how to effectively communicate their education and their experience. Reflections on the observations and comments solicited from these stakeholders become iterative when the student decides what and how to incorporate the feedback he/she has received in each conversation. The resulting self narrative captured in the professional portfolio is a visible representation of both the reflective thinking process and product.

Read: Portfolio to professional: Supporting graduate student using digital, evidence-based storytelling

**Cristina Galván and José Luis Rodríguez Illera**

Reflective learning has been defined as a generic skill that student develop for improving learning. According to Dewey (2010): “We don’t learn from experience. We learn from reflecting experience”. The key component is the reflection of the process of learning as metacognitive process. However, the reflection about learning is a lesson itself, a process that needs time, assimilation and adaptation and is always in constant evolution. For this reason reflection on learning is a skill that can be improved with learning support at formal contexts. Reflection is to interact with oneself, previous knowledge, professional, personal and formal interests and contexts, is to recognize the others in the learning process, is to reflect about the action and is a source of empowerment. In the study, we describe how students can learn and reflect at eportfolios and how we analyse the skill based in literature review and the recategorization of definitions.

Read: Promoting reflection for lifelong learning in higher education

**Carra Leah Hood**

Research identifies common elements in the process of reflection (Rodgers, 2002; Landis, Scott, and Kahn, 2015): engaging actively with a problem or project, responding to a perplexing situation, examining beliefs and assumptions, and integrating new understanding into overall experience. These elements describe reflection as a process undertaken by and affecting a single individual. My article develops reflection in a similar but differently situated way: as a shared or community experience that, although an iterative, interactive process, affects more than a single individual. Through sharing with others, its transmission can prompt action by other than the person producing the initial reflection. Eportfolios facilitate this because they make passing on reflection a fundamental quality of the form. Reflection, transmitted through eportfolios and frequently encountered in the context of institutional assessment, becomes the crux of institutional learning and meaningful action as regards becoming aware of, reflecting further, and supporting effective structures for enhancing teaching and learning across a campus. In this way, reflection extends the dynamic bond between teachers and students to include administrators, nudging administrators to reflect on their choices, to interrogate institutional rhetoric, and to foster a culture of continuous introspective and campus-wide engagement based in the products of students’ learning.

Read: ePortfolios spark a campus-wide culture of reflection: Trickle-up effect
Reflection is a practical yet emotional self-exploration that allows for deeper learning and meaningful personal growth for students. When incorporated into the student experience, reflection has the capacity to build students’ confidence and improve their prospects moving into the professional world—it also has the ability to foster greater appreciation of individuality and build more inclusive, diverse communities on and off campus. Maximizing the power of reflection comes through making the implicit explicit, as students are challenged to share their thoughts with others and create meaning for their experience—one that is often steeped in the stress of rigorous study and financial strain—in higher education. Regardless of a student’s institution, major, or plans post graduation, reflection allows students to grow into lifelong learners with a strong sense of their own accomplishments and identities.

Reflection is the process by which a learner plumbs an assignment for additional insights. Reflections are a critical element in a well-formed ePortfolio artifact. Reflections can be unstructured (a simple paragraph describing work on the assignment) or structured with multiple prompts on specific aspects of the assignment. Reflections encourage students to be active learners, looking to discover new lessons from an assignment. Reflections transform an ePortfolio from a pretty online display of work into an accurate portrait of the student as a learner. The quality of a learner’s reflections is a significant indication of the seriousness with which a learner takes her/his education.

Reflection has been considered a purpose, as well as theoretical underpinning, of creating an ePortfolio (Genc & Tinmaz, 2010; Stefani, Mason, & Pegler, 2007). In this paper we see reflection as a process of coming to know oneself as a teacher. In relation to an ePortfolio, reflection “enables students to document and track their learning; develop an integrated, coherent picture of their learning experiences; and enhance their self-understanding” (Rickards et al., 2008, p. 34). Through reflective writing students integrate their forming teacher identity with evidence of their expertise that emerges from actions related to the competencies of being a teacher. Therefore, agreeing with Jay and Johnson (2002), we consider reflection is a process, both individual and collaborative, involving experience and uncertainty. It is comprised of identifying questions and key elements of a matter that has emerged as significant, then taking one’s thoughts into dialogue with oneself and with others (p. 76). This is done in order to act with more thoughtful commitment and ethical intent. In this way reflection is seen as an emergent process of bringing into relationship past, present and forming experiences, with others who have a similar commitment to the undertaking of becoming a worthwhile teacher.

Reflection can be defined using the following core concepts:
1. Reflection is an essential tool for connecting ideas and experience into an integrated whole.
2. Reflection begins with self-reflection.
3. Reflection is collaborative and communal.
4. The primary goal of reflection is intellectual growth.

Read: Piecing together the puzzle: ePortfolio as a means of reflective study

Read: Adding meta-reflections to an ePortfolio

Read: A roadmap to digital ePortfolio proficiency: Creating the conditions for cross-course, cross-program and cross-life professional learning
Portfolio to professional: Supporting graduate student using digital, evidence-based storytelling
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Nicola Walker, Tim Hopper, Hong Fu and Kathy Sanford

Call for proposals

AAEEBL annual conference
In Fall 2013, adults ages 25 and older represented close to two-thirds of U.S. graduate students attending school full-time at public and private non-profit postsecondary institutions. The numbers are even higher for part-time students and students at for-profit institutions. Many of these students come to graduate school with diverse educational and professional experiences yet, they are rarely prompted to reflect, synthesize, and express their full stories in a purposeful manner. Graduate students often face unique challenges, as they build expertise in a discipline or field and consider varying career pathways that may be evolving and uncertain.

The Portfolio to Professional (P2P) program at Stanford University guides and supports graduate students from all disciplines to reflect on their own experiences in order to understand their self-story. Students create an ePortfolio that reflects their narrative for a chosen audience. Originally modeled after the “Portfolio to Professoriate” curriculum developed by Professor Lisa McNair of Virginia Tech University (McNair & Garrison, 2012), the Stanford P2P program intentionally expands the scope of career pathways from solely the professoriate to the broader professional in order to accommodate the unique needs and interests of graduate students seeking to explore both academic and industry pathways.

**Design**

Since 2013, the program has served a variety of graduate student audiences in a variety of formats. Past cohorts have included only PhD students, mixed groups of masters, PhDs, and postdocs, and cohorts with a disciplinary focus, such as education and the humanities. In the majority of the cohorts, there has been representation from a diverse range of disciplines, schools, and programs from across campus.

**The Curriculum**

The P2P curriculum focuses on the intersection between the concepts of folio thinking, storytelling, and digital presence (see figure 1).

We define folio thinking as the reflective practice afforded by structured opportunities made available through the process of creating a portfolio (see figure 1). Through this
process of reflection students are able to integrate, synthesize and foster self-understanding of their educational experiences (Penny-Light, Chen, & Ittelson, 2011).

Storytelling involves using specific strategies to develop a professional brand story in the digital space. In today’s digital landscape, as the old PR adage goes, “if you are not telling your story, someone else is.” We encourage students to take ownership of their own story and think through how to tell it in a digital environment for different purposes. Providing students with four specific different storytelling strategies gives students concrete direction on how to create their story and then shape it for a digital presentation.
Working through this process allows students to begin making connections among their diverse life and educational experiences. This allows students to not only reflect, but to see connections that can they had not realized were there previously that can help contribute to their future pathfinding (see figure 2).

Digital presence refers to understanding the digital environment and the tools and space needed to tell your story. We are working within an ever-shifting digital landscape. As consumers, we are all pseudo experts on digital information, which influences how we take in information and what we find credible. Understanding the different elements of the digital environment is key to reaching a specific target audience for the ePortfolio, whether the audience is an employer, a teacher, a peer or simply oneself.

This includes understanding how an ePortfolio fits within the larger ecosystem of digital properties a student may own, such as their social media channels or other websites where their biographical information or work might be featured. Understanding the digital landscape also includes understanding which digital platform will be the most effective at telling a particular story.

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Figure 2: Created by Helen Chen and Sheetal Patel. Four storytelling strategies are given to P2P students to help get them started on writing the overall narrative they wish to share with their digital audience.
Each of these three concepts requires a different strategy for reflection, including feedback from multiple takeholders on a student’s articulation of a brand story, the artifacts and evidence used to represent that story, and the digital representation of the story and artifacts. Therefore, built into the curriculum are multiple opportunities for feedback from peers, staff, faculty, alumni, and employers.

To address each of these concepts, the curriculum in its most expanded form, includes ten modules as seen in Table 1.

**PORTFOLIO DESIGN**

We often get questions on platform selection. In fact that is usually what students and instructors want to speak about first. We first ask students to step back and think through some guidelines before thinking through platforms. First, without knowing the story you want to tell, it is hard to choose a channel through which to tell that story. So we encourage students to first think about the story, as well as the evidence and artifacts they have to help tell that story.

While many institutions ask students to use the ePortfolio platform to which the institution subscribes, students should consider: 1) whether they can take the portfolio with them once they leave a university; and 2) their own comfort level and skills with technology.

Before selecting a platform, the students should carefully consider these various issues but do not need to know all of these things before they choose a platform: the purpose and audience for the ePortfolio, how the ePortfolio will be used (which can lead to questions about permissions and accessibility), how much time a person wants to invest in developing technology skills, their ePortfolio, their own comfort in using new technology tools, what their own digital workflow looks like currently, what tools they are currently using, how often they plan to update their ePortfolio (ease of platform to allow updates), if tracking who has visited is important, if there is a need for specific digital or visual features to tell the story, ownership after a student leaves the university, the ability to export an ePortfolio should a platform switch need to occur, and what they want their ePortfolio to look like. Students learn

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<tr>
<th>#</th>
<th>Module Title</th>
<th>Module Description</th>
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<tr>
<td>1</td>
<td>Eportfolio Purpose and Audience</td>
<td>Students learn about what an ePortfolio is and begin to think about their own purposes and audiences for their ePortfolios.</td>
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<tr>
<td>2</td>
<td>Developing Your Story</td>
<td>Students develop their own stories by thinking through four different storytelling strategies.</td>
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<td>3</td>
<td>Platform Review</td>
<td>Different platforms in which to build an ePortfolio are reviewed, including issues to think through before selecting a platform.</td>
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<td>4</td>
<td>Content and Evidence</td>
<td>Students begin to piece together content and evidence that support their story.</td>
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<td>5</td>
<td>Visual Design</td>
<td>In an ever changing digital landscape, students are given basic visual design rules to apply to their own ePortfolios.</td>
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<td>6</td>
<td>Career Coach Feedback Session</td>
<td>With initial drafts in progress, feedback and reflection sessions continue by inviting career coaches to the classroom to help give a different perspective.</td>
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<td>7</td>
<td>Alumni Feedback Session</td>
<td>Feedback and peer reviews continue the reflection loop as alumni are invited into the classroom in person or virtually to give feedback on ePortfolios.</td>
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<td>8</td>
<td>Faculty Feedback Session</td>
<td>Faculty are invited to the classroom in person or virtually to give feedback on ePortfolios.</td>
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<td>9</td>
<td>Metanarratives</td>
<td>Students begin preparing for the showcase by thinking through the metanarrative that brings their ePortfolio together.</td>
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<td>10</td>
<td>Showcase</td>
<td>After 10 weeks of work, employers, alumni, faculty, students, and staff are invited to a showcase, where students can present their stories and receive feedback on a piece of their work-in-progress ePortfolio.</td>
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basic visual design principles as part of the curriculum so that they feel more confident that their story will achieve their intended goals.

Implementation

The P2P program at Stanford has been offered in a variety of formats: one-time workshops, sequenced online sessions, a hybrid of online activities supplemented by weekly face-to-face interactions in a ten week seminar, and a weekly in-person seminar course. Students participate in portfolio creation through virtual and face-to-face feedback sessions with career coaches, peers, alumni, faculty, and other community members.

Throughout this process, students engage in an iterative process of reflection, as they consider how they want to represent themselves, their work, and the knowledge and experience they are developing in their chosen field of expertise.

A variety of strategies are employed, such as soliciting feedback from a variety of portfolio stakeholders and using think-aloud protocols and peer review techniques.

A final showcase event at which students are invited to share their portfolios with a broader audience is an important milestone in the program and provides external accountability for the students. We have experimented with the several formats for the showcase including:

- Traditional poster session-style model with students sharing their portfolios as invited guests circulate;
- A formal program with each student presenting one or two completed pages from their portfolio for five minutes to a room of peers and community members;
- Small group presentations with three to five students sharing their work-in-progress portfolios with two reviewers, who are asked to comment, while remaining students and guests provided feedback on index cards.

Preparations for the showcase have involved collaborating with colleagues in career services to get recommendations for faculty, staff, and alumni from academia and industry who hire or work with individuals with masters or doctoral degrees. Some training and orientation to ePortfolios for the reviewers is often necessary in order to establish the context and expectations for the event, particularly given the diverse interests and goals of the students and their portfolios. We ask students in their introductions at the showcase to state the purpose of their portfolio, their target audience, and to identify specific questions or issues they would like the reviewers to address in their feedback and comments.

On a programmatic level, P2P has served to unify and engage campus partners from professional schools, departments, career services, teaching and learning, and graduate education around a shared mission of supporting the professional development of graduate students. A partnership between the Registrar’s office and BEAM, Stanford Career Education has supported the expansion of the P2P program. In addition, an experimental approach allowing the piloting of different formats to accommodate the unique needs of different student communities has engaged, a range of campus stakeholders as valuable advocates for the program. These partners include colleagues representing the Vice Provost for Graduate Education, Postdoctoral Affairs, specialty career centers in the schools of medicine and education, as well as individual departments, programs, and student groups.

Evaluation

P2P was a valuable program for three main reasons: (1) it held me accountable for making progress on my website (which often got put last on my to-do list), (2) it provided plenty of opportunities for peer and professional feedback on my website, and (3) it forced me to think about a more creative way to present my work (telling my story, creating a narrative, and tying all of my work together). [P2P Student]

More than 650 graduate students have engaged in learning about ePortfolios through P2P in its various formats. A gallery of student ePortfolios can be viewed through the Stanford P2P website (see figure 3).
Figure 3: Screen shot from P2P website: Anna Toledano, Stanford doctoral student and P2P program alumna. P2P student work can be viewed at StanfordP2P.weebly.com
Through each iteration of the ePortfolio course, evaluations have shown the positive influence of the process of creating an ePortfolio. Within the qualitative feedback we received, which included open-ended questions in two surveys and a focus group with students who had taken the course, there were three main themes. First, students valued the opportunity for reflection and feedback from multiple stakeholders. 

The feedback from instructors and participants in the showcase was the most valuable. I really enjoyed getting the opportunity to tell people my story face-to-face and to have them help me pick out the highlights & hooks in my stories. [P2P Student]

Alumni and employers also thought the process was valuable for students:

Putting together an e-Portfolio allows them to take inventory of their lives and see their accomplishments from another perspective. This will give them confidence and self-encouragement. These students have poise and knowledge and it comes across as they described their ePortfolios. I must say I was very impressed. [Stanford Alumnus]

Second, students wanted more accountability provided in the course, in order to give themselves permission and time to work on their ePortfolios. While the first iteration of the 10-week P2P course was online, and the second a hybrid of face-to-face and online, students still wanted more accountability. When we ran a pilot of the curriculum as a course, students responded that it was helpful to have a peer community to be accountable to.

[I need] more accountability and earlier and more assigned partners to check up on work. [P2P Student]

Third, it was clear that students needed a space to think through their own stories and the connections between their education, life, skills, research, ambitions, and other core parts of their identity. An ePortfolio provided them the process, directions, and a space to express that.

It forced me to think about a more creative way to present my work (telling my story, creating a narrative, and tying all of my work together). [P2P Student]

It pushed me to create something valuable and important for my career development. The story framework was especially compelling. [P2P Student]

Data from student surveys collected at the end of workshops, lectures, and courses, confirmed that the majority of students found the concept and process of ePortfolios valuable. We used a Net Promoter Score (NPS) as one measure of the 10-week course. This is a common marketing measure that asks the participants, “Would you recommend [item, product, service] to a friend?” and rate their response on a 0-10 scale (Reichheld, 2003). Students found the concepts taught valuable enough to promote to their own friends with scores consistently above 70% for the 10-week course. Indeed many of our students have referred their friends to P2P sessions.

All students agreed or strongly agreed that the 10-week in-person course was a valuable experience, that it provided the needed resources, and that the feedback was valuable. In lectures (one time sessions) and workshops (2-3 sessions) students (typically 20-70 students), the majority of students also agreed or strongly agreed about the value of the material. The one limitation for quantitative feedback is that the P2P 10-week course usually includes a small number of students (8-20 students).

Given the feedback we have received from students, we have made changes to the P2P course over time. We have moved the course to in-person sessions, given students desire for feedback and reflection plus accountability.

In addition, we provided more opportunities for feedback from a variety of stakeholders, given that students found this the most valuable piece of creating their ePortfolios. Lastly, each community of students (e.g., PhDs in Humanities versus Engineering PhDs) has different needs based on their fields and faculty influencers. To meet the needs of these different groups, we tailor the curriculum for community-specific workshops. For example, one group may need more time to understand the benefits of an ePortfolio. Another group may need more time learning about platforms. Tailoring helps empower students to tell their individual stories.
Next Steps and Future Directions

At its foundation, P2P aims to provide students with a platform and a community to encourage reflection and metacognition intrapersonally and in conversation with others. The end result goes beyond the production of tangible student portfolios. The P2P program brings campus-wide recognition of the unique needs of master’s, doctoral, and postdoctoral students and awareness of available services and resources.

Looking to the future, P2P aims to address the challenges of access and scale through the creation of a set of online curriculum modules that will be publicly and freely available as an open educational resource. We are also interested in partnering with colleagues on campus and at other institutions to improve upon, expand, and enhance the curriculum with multimedia as well as to build a gallery of portfolio examples, organized by discipline and purpose. We see opportunities to accommodate discipline-specific needs to design storytelling strategies for undergraduate researchers seeking to communicate their research to a broader audience.

P2P has allowed graduate students not only to tell their stories, but also to find a space to explore that story and to reflect on that journey. This empowers graduate students no matter what career pathway or destination they face in the future.

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Promoting reflection for lifelong learning in higher education

by Cristina Galván and José Luis Rodríguez Illera

edited by Heather Caldwell

The social interest in improving the quality of higher education generates debates, studies and reports in the academic community. One of the main concerns is students’ abilities to complete their courses with a set of acquired competencies that enable them to progress in any academic or labor context. These competencies are oral and written communication, autonomous learning, teamwork, and digital literacy, among others (Bologna Working Group on Qualifications Frameworks, 2005; Johnson, Levine & Smith, 2009).

In this respect, ePortfolio use is becoming increasingly widespread in higher education (Cambridge, 2001; Lambert & Corrin, 2007; Zubizarreta, 2009; Buzzetto-More, 2010). Their use in demonstrating competencies has also been highlighted by Abrami and Barrett (2005) in their proposal on the focal points of research on ePortfolios and, more specifically, in the ePortfolio design research carried out by Grant, Marshall, Strivens and Clark (2006). There are several reasons behind the interest of ePortfolio use (Rodríguez Illera, 2009): a) it is a tool that brings together students’ learning experiences and enables teachers to generate value judgements based on evidence (through this perspective, the ePortfolio can offer teachers a "history," a continuum of experience, and not a mere snapshot, as occurs in traditional assessment); b) it places the practice of teaching at the heart of students’ work and also stimulates a transformation of the pedagogical relationship that emphasizes the development of higher levels of student autonomy; c) ePortfolios are tools for analyzing evidence and promoting responsibility in respect to what is being presented as evidence; for example: the fact that documents are viewed outside the author’s private space and may be subject to assessment by another person (teacher) implies a higher degree of commitment in what is being presented; d) the use of ePortfolios represents an alternative vision for higher education characterized by its focus on evidence and the results of learning; and e) it shifts the locus of control from the teacher to the student.

These approaches are aimed at ensuring that the ePortfolio is an instrument that enables university students to carry out a series of activities, such as (a) connecting the learning generated over the course of their academic and work career, (b) developing generic competencies, as well as demonstrating them, and (c) producing and publishing their portfolios for academic assessment, and for gaining access to employment and promotion. This process of
continuous learning requires a responsible, reflective, and active attitude on the student’s part.

The practices that students carry out in the learning process were initially theorized by Marton and Saljo in 1976 and laid the foundations for the Student Approach Learning (SAL) model. In this model, “learning approach” is defined as the adaptation of strategies implemented by students in order to carry out their academic tasks, distinguishing between a deep approach and a surface approach. A subsequent research study produced by Biggs, Kember and Leung (2001), defines the factors that determine each approach. They found that the factors of a deep or surface approach were determined by the type of strategy employed, such as selective memorization, search for meaning, or optimal management of time and work space.

However, in a more recent review (Biggs, et al., 2001), it was determined that the factors that characterized the approach were motivation and strategy, in a mutually exclusive yet complementary way. A deep approach characterizes students who are motivated and use strategies for the purpose of gaining knowledge. They have an intrinsic interest in what they are learning, interact with the content, link new ideas, and perform their tasks with personal commitment. Meanwhile, in the surface approach there is no reflection on the purpose itself or on the strategies used. Nor is there any effort made out of personal interest. Recio and Cabero (2005) state that the deep approach is geared towards the transformation of knowledge by the student, and that the surface approach is the mere reproduction of information during the learning process. Biggs, et al. (2001) developed the 3P Model of Learning, an approach based on presage (the student factors and teaching context prior to the learning activity), process, and product. This model is used to design and analyze any didactic treatment and for subsequent suggestions for improvement, with the emphasis on the responsibility of teaching staff and on students’ learning approaches.

In order to achieve the “improve learning” objective, students reflect on their practices and determine their attitude towards learning and subsequently draw up a personal development plan based upon their strengths and weaknesses (Stefani, Mason, & Pegler, 2007). This meta-cognitive reflection does take into account the three types of educational settings (formal, non-formal, and informal), as well as the transfer of academic knowledge to everyday life and work life, and vice versa. One way of optimizing reflection is the learning process and of assessing the learning of a subject through ePortfolios use (Stefani, et al., 2007; Lopez-Fernandez & Rodriguez, 2009). In the academic setting it is important to consider three agents that are crucial in the educational process and also during ePortfolio use: (a) the active student, (b) the teacher who acts as a learning facilitator and guide, and (c) the institution as the party responsible for facilitating the learning task. These three agents are present throughout the ePortfolio creation process and work together towards achieving the main objective behind ePortfolio use: improving students’ competencies. It is to be assumed that the mental operations performed with ePortfolios will improve over time and will perhaps leave a cognitive residue (Salomon, Perkins, & Globerson, 1992), although ePortfolios may also enable us to improve some cognitive operations in the short term, e.g. those that we perform when using the ePortfolio.

This case study’s objective is to confirm the improvement of some cognitive and meta-cognitive competencies that are generic and transferable to other practices as an effect of ePortfolio use.

The central hypothesis in the study is that the continued and advanced use of an ePortfolio system, with a didactic treatment, improves some general competencies of the students. Specifically, two competencies have been chosen that are common to different ways of using the ePortfolio: (a) information management and (b) learning planning which is linked to reflection of learning. One example of the first competency is the selection and organization management of information presented in the ePortfolios, while the second competency refers to the student’s self-regulation (Zimmerman, 2002) in order to produce the portfolio through reflection, deadlines, teachers’ comments, etc. The two competencies are closely linked in the student’s learning improvement activities. Portfolios are most typically used for
the assessment of learning and of competencies. However, this case study has also encompassed the effects that the continued ePortfolio use with the Digital Folder platform has on these competencies.

**Method**

This is an ex-post-facto case study to determine how a didactic treatment with portfolios facilitates the development or improvement of certain generic competencies. For this purpose, two questionnaires have been used that provide quantitative data on several dimensions related to the learning and assessment experience and to the development of these competencies.

The chosen ePortfolio platform is Digital Folder. This platform is designed from a pedagogical perspective and facilitates the student's self-regulation of learning. There are 5 main characteristics of Digital Folder: (a) to provide the student with the necessary tools to create a competency-based portfolio and (b) to provide the teacher with the necessary tools to facilitate the management of the ePortfolio assessment. These advantages are complemented with: (c) a system of dialogue between the teacher and student in order to enable contextualized feedback on various sections and evidence in a portfolio (Rodriguez, Aguado, Galvan, & Rubio, 2009), (d) a PLE with online resources and social networks linked to learning evidences (Rodriguez, et al., 2014) a system that enables different administration levels for managing course enrolments, users, and metadata for the competencies, depending on the needs of each subject, degree course, center, or faculty.

**Participants**

The case study has been carried out over the last three academic years, from the following three degree courses: Audiovisual Communication, Pedagogy, and Social Education, all at the University of Barcelona. The teachers participating in the case study are experts on ePortfolios use and have been using the same platform for ten years. They have an established methodology for working with portfolios based on continuous assessment. The portfolios include a problem-based learning component. The criteria for teacher selection reduces the likelihood of pedagogical and technical problems based on experience during the course of this study.

The students in these courses constitute the study sample. In total 107 students have taken part, all on a voluntary basis. They are students from different year groups but most are studying second cycle degree courses. The Pedagogy students are accustomed to using paper portfolios for assessment, unlike the Audiovisual Communication students who have prior knowledge of professional portfolios. The theme of all the subjects, albeit focusing on different aspects, is related to information technology and communication applied to education.

**Work Plan**

The method taken in each course for successful portfolio use include: 1) knowledge on the part of students of what an ePortfolio is, 2) work with the ePortfolio on a continued, periodic, and summative basis, and 3) active feedback between the teacher and student.

As such, this session focuses on encouraging students to use the ePortfolio on a regular basis by showing them the advantages involved: being able to demonstrate academic and personal activities that are examples of acquired knowledge; gaining easy and fast access to learning evidence from anywhere; sharing portfolios with other people (colleagues or otherwise) and even promoting themselves innovatively.
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in the job market; making use of technology in the learning process; among others. In this session ePortfolio benefits are explained, such as: using an ePortfolio makes students take responsibility for their learning process in order to achieve both their own goals and those corresponding to each subject. Therefore, they must self-manage their learning time, improve their communication with teaching staff in order to resolve uncertainties, and direct the teaching-learning process towards the competencies that they wish to or must develop. This conception of ePortfolios is shared by several authors, such as Cambridge (2001), Barrett and Carney (2005), Cambridge (2009), Zubizarreta (2009), Cambridge (2010), Barberà (2008), and others.

In this session they are also taught how the Digital Folder platform functions. Furthermore, other student ePortfolios are shown as examples in order for them to gain a better understanding of what to do in an ePortfolio. Halfway through the initial session students are reminded of some of the platform options, the portfolio contents, and some key aspects of the ePortfolios. All the training sessions are adapted to the subject contents. During the academic year students are provided with both online and face-to-face support.

All students ePortfolios have a minimum common structure: a table of contents, which classifies the evidence of learning into sections or sub-folders according to the curricular purpose of the subjects; the organization; and a minimum of common contents of all the subjects as follows:

- “Classroom or mandatory activities”: mind maps, participation in online forums, problem solving, and reading commentaries.
- “Project”: project that is produced over the course of the subject and that includes knowledge, procedures, and attitudes.
- “Complementary activities”: activities that have already been completed or that are completed over the course of the subject on the student’s own initiative.
- “Reflections”: reflections generated after carrying out the learning activities in order to complete what will become the learning evidence.
- “Curriculum Vitae”: curriculum vitae of the student and other evidence of professional, academic, and personal training.

Throughout the process, and on the basis of the progressive contribution of learning evidence, the teachers conduct online and face-to-face feedback sessions with the students at various times. These comments help improve the subject activities and the learning process. The platform enables the sent messages to be placed close to the document, section, and/or portfolios to which they refer in order to facilitate understanding of the message.

Figure 2: Dialogue of feedback between a teacher and student linked to a document.
Description of the Instruments and Data Gathering

Data was gathered at the start and end of each course in order to evaluate the ePortfolio effectiveness on improvements in the two chosen competencies: information management and learning planning. The ‘pre’ test was taken at the start of the semester during the ePortfolio initiation session, while the ‘post’ test was taken upon completing the subject and, therefore, in the ePortfolio’s final phase.

Two questionnaires were used as the data gathering instruments: Revised two-factor study process questionnaire (Biggs, et al., 2001) and Assessment Experience Questionnaire (Gibbs & Simpson, 2003). Both questionnaires have been translated into Spanish, have been slightly modified, and have been adapted to ePortfolio use in line with the experience of Segers, Gijbels, and Thurlings (2008).

The first questionnaire evaluates the students’ learning approach, as showed by Biggs, et al. (2001). We chose this questionnaire because the motivation component and the strategic component encompass aspects that take part of the two competencies analyzed. The second questionnaire focuses on how the student carries out his/her learning practice depending on the subject assessment process. Both questionnaires coincide in one aspect of the theoretical framework that is considered important for our application of ePortfolios: the shared responsibility of the teacher and student in achieving the final objectives (Biggs, et al., 2001; Gibbs, et al., 2003). In other words, the teacher plays the role of designing the learning process and, in this case, of designing a methodology involving ePortfolio use that facilitates the development of the established competencies. In different research studies (Ginns & Ellis, 2007; Ellis, Ginns, & Piggot, 2009; Gijbels & Dochy, 2006; Baeten, Dochy, & Struyven, 2008; Montano, Gonzalez, Hassall, Joyce, Germanou, & Asonitou, 2010; Fryer, Ginns, Walker, & Nakao, 2012) in which the revised two-factor study process questionnaire has been used, changes have been detected in the results between the points in time when data was collected despite the fact that most university students take a deep approach. In order to know these differences in greater detail when a didactic treatment is carried out, Recio and Cabero (2005) proposed the calculation of the intensities of the approaches and of their dimensions. This indicates the extent to which students adopt a certain approach or dimension and will facilitate a more detailed comparison between the ‘pre’ and ‘post’ points in time. The remaining data, the intensity, has not been analyzed since it is not considered necessary.

The analysis method of the instruments corresponds to author’s questionnaires guides. Having analyzed all the data, we reclassified the questionnaire items and the students’ answers in line with the specific characteristics of each competency: (a) planning and (b) management. (Table I 2016).

<table>
<thead>
<tr>
<th>Competency</th>
<th>Questionnaire and number of items</th>
<th>Characteristics of the items related to the competencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planning</td>
<td>AEQ: 16 R-SPQ-2F: 2</td>
<td>Effort; Extra commitment; Interest; Time spent; Study methods; Feedback revision.</td>
</tr>
<tr>
<td>Selection-Management</td>
<td>AEQ: 3 R-SPQ-2F: 9</td>
<td>Performance; Personal information; Marks; Satisfaction; Marks and effort; Content and assessment; Interest and extra commitment; Interest of content.</td>
</tr>
</tbody>
</table>

Results

The study shows the results of applying the questionnaires (a) AEQ to 99 voluntary students and (b) R-SPQ-2F to 88 students and (c) a comparative analysis of the level of the competencies before and after producing the ePortfolios, according to the students’ perceptions. First of all, we
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present the results of the questionnaires in terms of each questionnaire’s dimensions. These results help us know what perception students have of their learning approaches and their attitude towards assessment with ePortfolios. Secondly, the aforementioned results are matched to the development of general competencies as an effect of ePortfolio use.

In both questionnaires the Shapiro-Wilk test for normality has been applied and, given that most of the variables did not follow the normal distribution, the results have been analyzed with non-parametric comparison tests. This helps to find significative changes between the start and end of ePortfolio use.

**CHARACTERIZATION OF STUDENTS IN TERMS OF LEARNING APPROACHES**

We obtained results at the start and end of each academic year while the students were completing their ePortfolios, taking into account that most of our students were getting ready to graduate. Analyzing the learning approaches defined in the R-SPQ-2F questionnaire, we noted few although positive changes, before and after producing the ePortfolio (Table 2).

<table>
<thead>
<tr>
<th>Factor</th>
<th>Category</th>
<th>Percentage (%) Pre</th>
<th>Percentage (%) Post</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motivation</td>
<td>Deep</td>
<td>94.3</td>
<td>94.3</td>
</tr>
<tr>
<td></td>
<td>Surface</td>
<td>5.7</td>
<td>3.4</td>
</tr>
<tr>
<td></td>
<td>Undefined</td>
<td>0.0</td>
<td>2.3</td>
</tr>
<tr>
<td>Strategy</td>
<td>Deep</td>
<td>70.5</td>
<td>75</td>
</tr>
<tr>
<td></td>
<td>Surface</td>
<td>19.3</td>
<td>17.0</td>
</tr>
<tr>
<td></td>
<td>Undefined</td>
<td>10.2</td>
<td>8</td>
</tr>
<tr>
<td>Approach</td>
<td>Deep</td>
<td>87.5</td>
<td>88.6</td>
</tr>
<tr>
<td></td>
<td>Surface</td>
<td>9.1</td>
<td>11.4</td>
</tr>
<tr>
<td></td>
<td>Undefined</td>
<td>3.4</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 2: Percentage of motivation and strategy factors characterizing the students before and after producing an ePortfolio (n=88).

ePortfolio use enabled 80.7% of the students who had a deep approach to maintain it throughout the process. Furthermore, 8% of students improved their approach. Meanwhile, 89.8% have maintained their motivation at a deep level while 4.5% progressed from a surface approach to a deep one. Also, the learning strategy improved by 19.3% while 59.1% maintained it at the highest level.

To obtain a more exhaustive description of the scores, Recio and Cabero (2005), proposed a presentation intensity scale of the approach in the motivation and strategy factors. The scale has three degrees of intensity: Low, Medium, and High, according to the difference of the mean values (using a scale from 1 to 5) between the scores of the deep and surface approaches in both factors.

<table>
<thead>
<tr>
<th>Grading scale of learning approaches</th>
</tr>
</thead>
<tbody>
<tr>
<td>Difference of the means between the two approaches or dimensions</td>
</tr>
<tr>
<td>&gt;0 - 1.33</td>
</tr>
<tr>
<td>&gt;1.34 - 2.66</td>
</tr>
<tr>
<td>&gt;2.67 - 4.0</td>
</tr>
</tbody>
</table>

Table 3: Classification of the intensity of the approach according to the mean difference between the two approaches.

Given the widespread presence of a deep approach at both points in time, this scale enables the progress of each student to be identified with greater accuracy. Taking into account the intensity factor we found student improvement in their learning approaches.

At the start of the process 53.4% of the students were within the deep approach range with a high level of intensity. Once the process had been completed, this percentage rose slightly to 55.7%. The analyzed learning approaches composed of the motivation factor and the strategy factor, which were mutually exclusive in the questionnaire that had been distributed. In both factors, a high level of intensity within the deep approach had also been maintained with a slight rise (see table 4). A greater improvement in the strategy factor was noted given that 36.4% had a deep approach with a high level of intensity that rose to 43.2% after ePortfolio use.
Table 4: Percentage of each approach according to the level of intensity in the Strategy and Motivation factors (n=88).

<table>
<thead>
<tr>
<th>Level of Category’s Intensity (Approach-Intensity)</th>
<th>Percentage Strategy</th>
<th>Percentage Motivation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PRE</td>
<td>POST</td>
</tr>
<tr>
<td>Surface-High</td>
<td>19.3</td>
<td>15.9</td>
</tr>
<tr>
<td>Surface-Medium</td>
<td>10.2</td>
<td>0</td>
</tr>
<tr>
<td>Surface-Low</td>
<td>0</td>
<td>1.1</td>
</tr>
<tr>
<td>Undefined</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>Deep-Low</td>
<td>3.4</td>
<td>2.3</td>
</tr>
<tr>
<td>Deep-Medium</td>
<td>30.7</td>
<td>29.5</td>
</tr>
<tr>
<td>Deep-High Deep-Medium</td>
<td>36.4</td>
<td>43.2</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

**CHARACTERIZATION OF THE STUDENTS IN TERMS OF THEIR PERCEPTION OF THE ASSESSMENT**

The Assessment Experience Questionnaire is split into 4 dimensions:

1. Amount and distribution of the effort: scores the effort involved in producing an ePortfolio for assessment,
2. ePortfolio and learning: scores the carrying out of activities during the ePortfolio creation,
3. What you do with feedback: scores the usefulness of feedback for the student, and
4. ePortfolio assessment and learning: scores the understanding of learning with ePortfolio use.

Each dimension is composed of 5 items, except for the third, which contains 6 items. The questionnaire is scored on a 5-point Likert scale (1 = strongly disagree – 5 = strongly agree). The mean values for each dimension at the ‘pre’ and ‘post’ points in time have been calculated.

Once again, similar results are obtained at both points in time (‘pre’ and ‘post’), as shown in the table below.

The Wilcoxon test is used to check the existence of a significant correlation with ePortfolio use in the dimensions (2) ePortfolio and Learning (p=.000), (3) What do you do with feedback (p=.000), and (4) ePortfolio assessment and learning (p=.025).

Table 5: Comparison of the four dimensions of the Assessment Experience Questionnaire at the points in time prior to and subsequent to creating the ePortfolio.

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Time</th>
<th>Mean (SD)</th>
<th>Sig. (bilateral)</th>
<th>Wilcoxon Coefficient (z)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Amount and distribution of the effort</td>
<td>PRE</td>
<td>2.84 (.48)</td>
<td>1.000</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>POST</td>
<td>2.65 (.55)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(2) ePortfolio and learning</td>
<td>PRE</td>
<td>3.41 (.48)</td>
<td>.000</td>
<td>-7.920</td>
</tr>
<tr>
<td></td>
<td>POST</td>
<td>3.51 (.46)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(3) What you do with feedback</td>
<td>PRE</td>
<td>3.65 (.85)</td>
<td>.000</td>
<td>-4.329</td>
</tr>
<tr>
<td></td>
<td>POST</td>
<td>4.00 (.80)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(4) ePortfolio assessment and learning</td>
<td>PRE</td>
<td>3.53 (.66)</td>
<td>.000</td>
<td>-3.74</td>
</tr>
<tr>
<td></td>
<td>POST</td>
<td>3.62 (.72)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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In the first dimension (1) Amount and distribution of the effort: it scores the effort involved in creating an ePortfolio in order for the significance to be assessed. The sign. value is 1.000, which means that there has been no change in effort and time between the previous experiences with ePortfolios and/or with an exam.

At the end of the semester students evaluate the ePortfolio as an instrument that enabled them to improve learning, complete tasks, understand activities geared towards learning rather than grades, and, in parallel, to keep up to date with continuous assessment.

When students create the ePortfolio they complement information, they search more information to confirm their opinion (‘pre’ mean: 2.78; S=0.890 and ‘post’ mean: 3.03; S=0.915). It may be related to the selection management of information that will be presented subsequently in a final publication of the ePortfolio. One ePortfolio characteristics is their capacity to boost reflection on the contents and on the learning experience itself, which may facilitate the search for more information of interest to the student.

In line with the item “I consider most new topics interesting and often devote extra time to obtaining more information on them”, the ePortfolio creation encourages students to explore some contents with greater interest (‘pre’ mean: 2.53; S=0.909 and ‘post’ mean: 2.76; S=0.816).

The recommended reading has not been perceived as a core activity in the subjects (‘pre’ mean: 3.56; S=0.895 and ‘post’ mean: 3.32; S=0.989) for the ePortfolio creation. The role of recommended reading along with its relation to the activities and the ePortfolio creation should be considered.

It is possible that importance has been attached to activities that integrate knowledge, procedure, and attitude rather than to more conceptual activities. Meanwhile, it has been shown that the students preferred to search for extra information on topics of interest to them.

2. Planning of the ePortfolio creation process.

The students carefully reviewed feedback on previous activities as a strategy for carrying out the next set of activities and for improving necessary aspects. In general, they maintained a steady work rate with the ePortfolio, keeping up well over the course of the academic year (‘pre’ mean: 3.48; S=1.109; ‘post’ mean= 3.2; S=1.072) with no need to devote more hours according to the scheduled tasks (‘pre’ mean= 2.49, ‘post’ mean= 1.81; z=0.000).

The activities required ePortfolio creation did not involve a great deal of effort (‘pre’ mean: 3.25; S=1.090; ‘post’ mean= 3.65; S=0.947) for the students. One possible explanation is because the activities are common to other subjects (conceptual maps, reflections, projects). However, according to the questionnaires and other interviews, what they found most difficult was reflecting on the learning done. Meanwhile, on completing the subject they stated that they had a better understanding of what an ePortfolio is and how to create one.

Improving competencies through ePortfolio use

The analysis of the results above, together with the classification by competencies of the items of both questionnaires, indicates that ePortfolio use with the Digital Folder platform has contributed to the development of the following general competencies:

1. Selection and organization of information management for of tasks involved in producing the ePortfolio (carrying out activities and organizing evidence of learning according to certain criteria among other possible ones).
Feedback also plays an important role for the students when it comes to planning their learning. Although feedback was taken into account in order to modify a task, it was not transferable for most students when carrying out subsequent activities (‘pre’ mean: 3.51; S=1.451; ‘post’ mean= 4.02; S=1.119). After using the ePortfolio the students attached more importance to the feedback received (‘pre’ mean: 3.57; S=1.314; ‘post’ mean= 4.13; S=0.964).

Receiving feedback in a contextualized manner on the platform, online, and being able to maintain a dialogue may have aided this improvement. As such, we conclude that the students carried out the planning of their learning when the ePortfolio had been worked on continuously.

Both in the analysis of the questionnaires and in the analysis of the way in which the students develop the two general competencies, it can be observed that ePortfolio use offers significant changes in respect of the prior experiences of sitting for an exam or using a paper portfolio.

**Discussion**

This case study focuses on discovering how students improve general competencies by using ePortfolios and their perception in this respect. We have assumed that students who use an ePortfolio platform with a specific didactic treatment can acquire and improve generic and meta-cognitive competencies. The data we gathered from the questionnaires enabled us to: a) establish a series of cognitive changes with regard to the practice of learning and assessment through the short-term use of ePortfolios, b) confirm the development of the two competencies detected in our study, and c) obtain data to improve teaching practice associated with the use of ePortfolios.

Short-term ePortfolio use leads to cognitive changes related to an improvement in strategy and motivation in the learning process, in such a way that students achieve better results in learning approaches (see Table 4). Some more specific changes are: valuing learning more than grades, bringing together evidence of academic and non-academic learning, searching for complementary information to understand the subject better or out of interest, devoting a regular amount of time to learning, and considering the feedback received from teachers.

The significant differences between the two points in time results indicated an improvement in the development of competencies. Generally speaking, our students had deep learning approaches (Biggs, Kembert, & Leung, 2001) from the start of the courses. The didactic treatment enabled the students to improve their learning motivation and to modify their learning and assessment-focused strategies. The students also began to alter their conception of the practice of learning. That is, they perceived assessment processes as a resource for improving learning and broadened academic learning content in line with their own interests, as seen in the above results.

However, this change requires a period of reflection and training that helps them optimize their learning process. We consider the lack of necessary time for this purpose one of the reasons why there are not more significant changes in the calculation of motivation in semester subjects, as occurs in other similar research studies (Segers, Gijbels, & Thurlings, 2008). In fact, several institutions (Boston University, University of Leeds, Nottingham University) have an academic tutoring service to assist students with the learning process parallel to their academic studies, increasing their time commitment, and providing the necessary help. As such, students perceive their professional objectives in a context that is broader than the subjects themselves, which encourages them to set themselves more specific and personal goals in each ePortfolio.

**Reflection**

The results show a series of aspects that have been modified following ePortfolios use and that constitute, in part, the development of the two general competencies under analysis. However, these aspects do not explain the full meaning of each competency. Any subsequent studies should employ a qualitative methodology involving direct observation in order to complement the results obtained here. Evaluating the results, changes may be proposed in the didactic treatment employed. These changes may also come about if the students start to acquire a sense of ePortfolio ownership that involves taking responsibility for improving their learning. This attitude requires time, values, personal targets, and cannot be achieved in the short term. The use of feedback made by students in order to improve the activities and the general aspects of the ePortfolio may also be exploited in order to improve responsibility.
As Biggs, et al. (2001) points out, students and teachers are jointly responsible for the results of learning. For future studies we will establish an initial diagnosis that gives us more information in order to improve the learning process through ePortfolios and thus improve learning strategies and motivation as well.

The Digital Folder platform was designed to generate ePortfolios in an academic environment with the focus on students, while also designing it to take educational and institutional requirements into account. The Digital Folder platform was designed to generate ePortfolios in an academic environment with the focus on students as its main philosophy and educational and institutional requirements are also taken into account in its design (Rodriguez, 2009; Rodriguez, et al., 2014). The platform has facilitated the technical and pedagogical implementation of ePortfolios. For students, this implementation has been challenging at first and then motivating during the course. Some aspects related to a constructivist approach, such as active and self-regulated learning, reflective practice, and significant learning, have been strengthened through the use of some platform functionalities: privacy of content, private feedback between teacher and student, personalized organization of the information, reuse of evidence, labeling of competencies, etc. The fact that the students used a new digital platform offering possibilities that differed greatly from the role they were accustomed (generally speaking, they only used a virtual campus at the university) also facilitated learning new digital skills not highlighted in this case study.

Meanwhile, both the dimensions of the questionnaires and the analyzed competencies are implicit in the macro-competency of autonomous and self-regulated learning (Monerero, 2007; Rué, 2009). One of the possibilities offered by ePortfolios in education is to give students the opportunity to present their learning and competencies in a unique way, different from that of their colleagues. In other words, personalizing contents with their knowledge, reflections, experiences, and personal interests (Barrett, 2005; Becta, 2007; Zubizarreta, 2009; Cambridge, 2010). As such, the aim is to boost personal learning objectives and gear learning activity towards lifelong learning. It is in this respect that ePortfolios can be considered not only a learning assessment instrument but also a starting point for the lifelong training development of students (Buzzetto-More, 2010; Stefani, Mason, & Pegler, 2007; Cambridge, 2009).

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Promoting reflection for lifelong learning in higher education

CRISTINA GALVÁN AND JOSÉ LUIS RODRÍGUEZ ILLERA


ePortfolios spark a campus-wide culture of reflection: 
Trickle-Up Effect

by Carra Leah Hood
edited by Gillian Hannum

I will begin with a personal story, the plot of which is grounded in the shifting understanding of ePortfolios and reflection among professionals in higher education. My story starts a decade ago, two weeks before the end of the semester, in the writing classroom, where I am the teacher, a discomfiting role since students teach me at least as much as I presume to teach them. In this case, as in all of my classes, I circle the outer boundary of the computer lab where we meet twice a week, weaving through rows of desks and hovering behind one student or a group of students to view writing on screens, listen to conversations, and offer advice when asked.

Ten years ago, I incorporated ePortfolios into my writing courses, primarily because the writing program used portfolios (at that time, the writing program considered a portfolio a collection of writing from each student that included hardcopies of two essays and a research paper) for its end-of-the-year assessment. Rather than asking each student to submit hardcopies of those three assignments at the end of the term, I allotted class time during the last two weeks of each semester to helping students develop ePortfolios and set aside one class session each week for students to work on computers composing their ePortfolios. Early on, the ePortfolio assignment was a file management exercise. Each student organized course work by creating folders and naming files in such a way that a person outside the course could navigate the contents of the ePortfolio and locate the three writing samples for the writing program’s assessment. For their ePortfolios, students also wrote a final course reflection.

The ePortfolio counted twenty percent of a student’s course grade; however, I only took three features of their ePortfolio into consideration when grading: completeness, navigability, and presence of a final course reflection. I did not grade content; basically, I counted files. If I could locate all of the course assignments, the student would receive an A on the ePortfolio. I assumed this assignment would amount to an easy A for each student. Semester after semester, though, I found students struggled with this assignment, and the majority in each class did not receive As. Students left out assignments, including some they had completed; they did not name folders and files in ways that contributed to navigation, many consisted of a student’s last name followed by a number; and although most ePortfolios included a reflection, many reflections consisted of a list of items we covered during the semester preceded by a claim.
that the student had learned everything on the list. At first I blamed myself; I must be a really bad teacher if students cannot get As on the easiest assignment of the semester. Although I accepted the fact that might be true, I also looked for other explanations and sought to modify my instruction. For instance, I provided more direction for writing reflections, encouraging students to honestly evaluate their learning and to point out specific aspects of my teaching that contributed or did not contribute to their learning. Ultimately, though, students’ reflections did not help me understand the difficulties they confronted with the ePortfolio assignment. My frustration increased until about three or four semesters later, I returned to my original thought: I must be a really bad teacher. This time, I did not distract myself with other explanations.

I sat with myself, by myself, and asked myself what students’ experience of the ePortfolio assignment could teach me about learning, class dynamics, and the relationship between teacher and students.

As a result of this reflection, I revised my reflection prompts from non-specific prompts like “reflect on how the assignment went for you” and “describe what you learned in this course” to more guided prompts like “if you had more time to complete this assignment, what might you do differently” and “explain the ways in which learning from other courses helped you succeed in this one.”

Reflection

Time has passed; I have grown beyond viewing students’ ePortfolios as a way to learn about myself – that is, as a way to assess my teaching (Landis, Scott, & Kahn, 2015, p. 117). When I began teaching, I approached ePortfolios, like many writing teachers do, as a vehicle for assessment – course assessment through students’ reflections and program assessment through students’ writing samples, or artifacts (Cambridge, 2009, p. xiii; Desmet, Miller, Grinnin, Balthazor, & Cummings, 2008, p. 18). I did not approach ePortfolio reflection as a type of student learning. Not surprisingly, neither did students. This mistaken approach resulted in inauthentic reflections and, ultimately, frustration with their ePortfolios, although I failed to comprehend the source of my frustration adequately at that time. Generally, I received reflections attesting, “the course was great; the teacher was great; and I learned a lot.” I appreciated those comments, but didn’t believe them. And why should I? Students probably felt trapped by the rhetorical situation, since they submitted their ePortfolios prior to the end of the semester for a course grade, and opted to massage their teacher’s ego rather than honestly reflect on their learning process, their struggles and achievements. They feared, perhaps, that admitting not learning something we studied would result in a lower grade for the assignment or even for the course. Although I would not have lowered any student’s grade for that reason, I received such an overwhelming number of inauthentic reflections, I could not ignore this possible motivation. Ultimately, I came to understand those inauthentic reflections as a form of self-protection.

I learned a few things from this introspection; the first, I learned from thinking back on my undergraduate experience in creative writing courses, and the second, oddly enough, from writing my teaching reflection for promotion and tenure.

1. Reflection can occur at the end of an assignment or at the end of the semester; however, it can also occur during an assignment, an especially meaningful practice in the context of well-scaffolded assignments (Rickards & Guilbault, 2009, p. 17). Reflection at the end may not result in as effective student learning as reflection throughout, in part because the latter offers students a vehicle for making changes before submitting a final project but also because it opens up opportunities for dialogue with the teacher and other students (Landis, Scott, & Kahn, 2015, p. 113).

2. Reflection, by definition, describes the process of looking inward at learning struggles and accomplishments. However, the reflection assignment in a course reports out to an audience. Both the inward look and the external report carry risks – different and, at times, competing risks.
ePortfolios spark a campus-wide culture of reflection

CARRA LEAH HOOD

Very few students may be equipped to take those risks, or to reconcile them, during a semester in any way other than writing an inauthentic reflection of the sort I tended to receive (Landis, Scott, & Kahn, 2015, p. 118).

LESSONS LEARNED

These two lessons have one commonality. They reveal the dialogic nature of reflection – and of the learning that takes place through reflective dialogue. In addition, though, they also underline the role authentic reflection can have in facilitating the spread of knowledge and, in some cases, contributing to change (Chang & Baldwin, 2008). Faculty members who participate in program assessment understand the ways in which portfolios contribute to conversations about teaching and learning (Rafeldt, Bader, Czarzasty, Freeman, Ouellet, & Snayd, 2014). In my experience, those conversations can lead to collaborations and to new course assignments, readings, and approaches to discussion. Program assessment generally focuses on students’ assignments, though, not their reflections (Rickards & Guilbault, 2009, p. 21-22). However, an individual teacher might review reflections, as I have done, for students’ reactions to teaching and assignments or students’ perceptions of their learning (Eynon & Gambino, 2014). Unfortunately, what teachers learn as a result of course or program assessment might not become part of a broader dialogue about teaching and student learning.

THE PROPOSITION

I began to appreciate possible benefits of authentic reflection beyond the classroom and the program once I moved from the faculty into the administration. In my current position in the Office of the Provost, I oversee annual and periodic program review and faculty evaluation for promotion and tenure. The Division of Academic Affairs at the institution where I work encourages a culture of reflection, part of which involves faculty members reporting as well as reflecting when they write program reviews and evaluation files. Faculty members can, like students, write inauthentic, congratulatory reflections, and some do. However, authentic reflections, characteristically self-examining and constructive, have become increasingly more prevalent. Authentic reflections provide insights into pedagogy, relationships between teachers and students, program faculty dynamics, research processes and challenges, and contributions to program, university, and community service. Since the Provost provides funding for professional development, to facilitate research, and for service initiatives, faculty reflections when considered in the aggregate can prompt needed support for one or more component of faculty work.

Inauthentic reflection provides no benefits to the producers or the recipients, except to signal the absence of conditions for the production of authentic reflection. On the other hand, authentic reflection contributes to a conversation at an institution of higher education about the primary work of that institution: teaching and student learning (Eynon & Gambino, 2014). It does this most effectively when all populations participate in the act of authentic reflection and when reflection feeds pedagogical efforts (see Figure 1).

Figure 1: Campus-Wide Culture of Reflection
ePortfolios offer a platform to collect reflection (from students) (Yancey, 2009, p. 5), to converse (among program faculty members), to assess learning outcomes (in the context of program and institutional assessment), to transfer the knowledge gained through reflection (by faculty in their evaluation files), and to curate reflections in such a way that they can be used to enhance classroom teaching and learning processes (by the Provost).

At the institution where I work, this process has led to a number of funding decisions intended, on the one hand, to support faculty work and, on the other, to enhance classroom practices. The following two examples provide illustrations of the kind of changes a campus can initiate as a result of institution-wide reflection. Both of these examples relate to funding for scholarly and creative projects that grow out of and feed back into classroom practices and student learning. All of the funded projects directly involve students and demonstrate instances of pedagogical leadership on the campus; many have resulted in publication. Furthermore, in these two cases, establishing funding sources signals the responsiveness of the Provost to faculty members’ reflections on their needs and accomplishments as well as encouragement to continue eliciting authentic reflection from students.

1. One section of a periodic program review generally chronicles faculty members’ scholarly and creative activities. This listing includes accomplishments of full-time tenure-track and tenured faculty as well as part-time and adjunct faculty. Although full-time tenure-track and tenured faculty apply for and receive internal funding to support their research endeavors, adjunct faculty members have not been eligible. Over time, after reviewing a large number of program reviews, it became clear that adjunct faculty members contributed to program scholarly and creative agendas. In addition, some program reviews noted the absence of funding for adjunct faculty members to complete individual or collaborative projects. As a result of thoughtful consideration of this situation, the Provost initiated an opportunity fund specifically targeting adjunct faculty members’ research, creative projects, and pedagogical innovations. Since then, twelve adjunct projects have received funding, and five adjunct faculty members presented their research at this year’s adjunct faculty orientation.

2. The institution where I work encourages faculty members to create high-impact learning experiences (HIL) for students. This type of learning frequently includes service learning, community engagement, or other forms of experiential learning. Although professional journals publish articles on the scholarship of engagement, particularly journals that focus on the scholarship of teaching and learning, and the institution where I work recognizes pedagogical scholarship in the context of faculty evaluation, there existed no internal funding for this type of work. Periodic program reviews and reports from the Office of Service Learning and the Center for Community Engagement demonstrated the impact of HIL on classroom pedagogy, on students’ learning, and on the local community. As a result of reflecting on the importance of HIL to students’ learning and to teaching and on the ways this kind of work connects to institutional values, the Provost dedicated an internal funding stream to scholarship of engagement. Since then, faculty members have received this type of funding each year.

Conclusion

When a college or university invests in an ePortfolio platform, the important benefits that can follow from creating a campus culture of reflection should be taken into consideration (Rafeldt, Bader, Czarzasty, Freeman, Ouellet, & Snayd, 2014), in addition to the benefits that accrue from utilizing ePortfolios for course, program, and institutional assessment. Since authentic reflection is difficult, risky, and requires instruction, institutions need to establish compensation and reward structures for faculty members and faculty members need to receive pedagogical direction for guiding students to produce the most searching reflections possible (Chang & Baldwin, 2008). Administrators, too, require encouragement to reflect honestly, especially if their reflections might lead to interrogating institutional rhetoric, to critiquing the distance of that rhetoric from students’ voices, or to identifying absence of student-centered perspectives from some decision making (Rodgers, 2002, p. 837). Creating a culture that values students’ authentic reflection is a critical first step in shifting to a reflective campus culture (Rafeldt, Bader, Czarzasty, Freeman, Ouellet, & Snayd, 2014).
ePortfolios provide the opportunity for and facilitate the initiation of this culture while creating the foundation for students’ voices and perceptions of their learning to trickle up through institutional structures, thus, becoming the basis for institution-wide – interdependent and responsible – conversation (Rodgers, 2002, p. 845). When students write reflections for their ePortfolios, faculty reflect on them in evaluation files, and committees reflect on the results of program and institutional assessment, students’ ePortfolios, documenting their educational progress as well as their metacognitive growth, can inform institution-level reflection and decision-making regarding funding, future directions, and support for student learning (Cambridge, 2009, p. xv).

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Product and process:
Reflective ePortfolio in game design programs

by Seth Hudson

N ow numbering in the hundreds, Computer Game Design (CGD) degree programs of study at colleges and universities offer a wide array of coursework ranging from the technical to the artistic,—mirroring the game industry itself,—that allows students to "customize their education to meet the needs of today's evolving technology workforce" (HEVGA, 2015). Web-based ePortfolios are an obvious fit for students needing to demonstrate relevant skills for employment in an industry focused on interactive products; they present the only reasonable means to showcase original playable content (Hoekstra, 2003; Mencher & Crosby, 2003; and Moore & Novak, 2011). Incorporating reflective practice concretizes both technical and non-technical ways of knowing (Schön, 1983), and is vital to the professional and creative development of CGD students (Hudson, 2016).

The following tracks the journey of a small-scale introduction of ePortfolio into the Computer Game Design Program, BFA at George Mason University. Beginning as a course requirement in an upper-division professional preparation course, to later introduction of a course earlier in the curriculum, the ePortfolio has taken root. Additionally, the author shares examples of how explicit, written reflective practice can be incorporated into courses to maximize the effectiveness of ePortfolio.

UNIQUE CHALLENGES FOR GAME DESIGN STUDENTS

Tip: Students must reflect to realize and highlight their individual contributions.

The game development process has evolved an increasingly complex structure that, sometimes, requires hundreds of individuals working toward the same end (Newman, 2013); this technologically-mediated, highly industrialized process renders individual authorship hard to determine (Bogost, 2015). Regardless of the skill level or technical proficiency that one's projects demonstrate over time, students constructing reflective ePortfolios seize an opportunity to establish an individual voice and style during the accretion of their works.

Additionally, reflection on collaborative practice allows students to consider their skills of collaboration and
communication, both vital to success in the game design working environment. One of the commonalities across CGD programs is a ‘studio component’ in the curriculum that provides intense collaboration required for the game industry (HEVGA, 2015), but failure to make reflection on practice explicit robs those experiences of their potential impact on the students, professional and personal development.

A QUICK ROAD MAP

**LEVEL 1 – INITIAL INTRODUCTION OF ePORTFOLIO**

*Tip: Rather than revamp an entire curriculum, start small.*

The CGD Program at George Mason University (game.gmu.edu) first addressed ePortfolio through the addition of a one-credit GAME 489—Pre-Internship Seminar with student learning outcomes geared toward professional development—securing an internship is required for graduation. Faculty understand the practical necessity of a portfolio for professional development, so introducing a single course had buy-in from all stakeholders.

The course was a success and continues to evolve with the inclusion of mandatory mock interviews and public presentations, all revolving around the student ePortfolio. Finding the right platform and discovering how to incorporate interactive playable content required effort on the part of students. No official standalone program was required by the department; students usually adopted free-to-use platforms like Wix and Wordpress that are offer fairly extensive user support. This self-learning ethos is a big part of the game design community at large (Newman, 2013; Ashton, 2010). In some cases locating artifacts from years past presented a challenge. Generally taken at the end of the third or beginning of the fourth year of study, students enrolled with varying levels of preparedness. As a faculty, we knew it was time to level up.

**LEVEL 2 – PLANTING A SEED**

*Tip: Early introduction can produce major results, organically.*

The 400-level course has evolved in terms of form and value since its implementation, but students sometimes reached that point in the curriculum with varying levels of preparation. It bears mentioning at this point: the need for ePortfolio in the game industry is well-established, so truly motivated students often have their own websites when applying to the program. Wanting to instill the need for ePortfolio development in students, the Mason CGD program added a one-credit GAME 300—Portfolio Preparation course to be taken in the second year of study.

The simple course description, “Student creates and refines an online portfolio to use throughout the course of study in presenting projects and to aid in internship application and professional development” (Piccione, 2016) has allowed faculty teaching the course to tailor each section to the individual needs and interests of students. Meeting learning outcomes both technical and non-technical—from acquiring a web host and packaging multimedia content for the web, to leveraging one’s portfolio in interviews and effective peer critique—this new course generated something akin to Bruner’s (1996)

<table>
<thead>
<tr>
<th>Levels of Program Implementation</th>
<th>Description</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level One</td>
<td>Initial Introduction of ePortfolio</td>
<td>Required one-credit course in professional development, generally take at the end of the third year</td>
</tr>
<tr>
<td>Level Two</td>
<td>Planting a Seed</td>
<td>Adding an additional one-credit course in the second year.</td>
</tr>
<tr>
<td>Level Three</td>
<td>Reflective Writing to Push Students Further</td>
<td>Drilling down on reflection and reflective writing in an upper division course.</td>
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<tr>
<td>Level Four</td>
<td>Organic Integration and Connection</td>
<td>Summary of progress and review of possible directions.</td>
</tr>
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</table>
culture-in-practice that permeates the student experience and is, hopefully, relevant to the rest of their professional and personal lives.

**Level 3 – Reflective Writing to Push Further**

*Tip: Making reflection explicit through writing enhances ePortfolio.*

Even though all those involved in the game production process have an impact on the narrative (Dansky, 2007; and Skolnick, 2014), students focused on art, coding, audio, or another aspect might not see the direct relevance of writing in their professional development. GAME 332 RS—Story Design for Computer Games is a writing-intensive course required of all students in the major, generally taken in the third year of study. In addition to demonstrating an understanding of narrative design and game writing, and the ability to implement various written components into games, students are required to incorporate reflection throughout the semester via guided exercises and informal peer-to-peer discussion. Peer review is a major component of the GAME 332 course, employing traditional writing workshop practices—in-class reading of student work, open critique with the author merely observing, etc. Note: A major component in other game design coursework projects is play testing, where the user experiences the creation of his or her peers—the documenting of player experiences and consultation with the creators offers ample opportunity for reflection.

During the peer-review and revision process, students submit reflective memos regarding how they incorporated feedback and the impact on their revision. Additionally, students are asked to create a ‘design philosophy’ early in the semester and revisit it periodically. Approaching student writing to Yancey’s (1998) model of reflection-in-presentation, an iterative approach to student work and reflection throughout coursework builds a student’s sense of self—a model that has also applications in CGD beyond the writing classroom. Part of the Writing Across the Curriculum program at Mason, the benefits of incorporating reflective practice creates a ripple effect that extends to other courses.

To align with game writing learning outcomes that challenge students to craft work within strict parameters of word-count and/or character limit, the assignment evolves through multiple revisions from a simple 2-page reflection to an eventual philosophy statement of 99 words, removing the first-person pronoun or the word ‘game’ (Hudson, 2016). Beyond the benefit of a challenging writing assignment, this writing process prepares students to reflect on their work in terms of personal approach/process.

**Level 4 – Organic Integration and Connection**

*Tip: Start Small and Buy-In Will Come.*

CGD programs are a recent phenomenon in higher education, and a degree in any major can aid a student in post-graduation employment 100% of the time or zero percent, the goal is demonstrating what a student has learned (Brathwaite & Schreiber, 2012). ePortfolios serve that purpose by offering potential employers tangible evidence of students’ competencies directly related to industry practice (Posey, Plack, & Snyder, 2015).

Formalizing reflection concretizes learning and allows students to consider what they may do differently in future work (Brown, Roediger, & McDaniel, 2014), something CGD programs can offer far beyond mastery of digital tools.

Students develop identity by reflecting on individual contributions to both the product and the process of creation; a sense of identity is prerequisite of students in creative fields, necessary for engaged participation and production (Weight, 2008).

Students in Mason’s Computer Game Design Program play different roles every semester, honing new skills and collaborating with new groups of peers. Building in a reflective component would maximize students’ sense of personal and professional identity.
The impact of reflective ePortfolios goes beyond the classroom in game design. Many students continue development of their games beyond the semester, or create others outside of their studies. ePortfolio also allows student incorporation of co-curricular projects (Posey, Plack, & Snyder, 2015). Rather than a hobby or simple labor of love, student work outside of the curriculum is amplified in terms of professional preparation.

**Final level**

CGD design is a nascent field in higher education that continues to evolve. In a “post-course era” where higher education must challenge the role and significance of single courses within a fixed curriculum (Bass, 2012), combined with the virtual necessity of ePortfolio for CGD students, maximizing the value of ePortfolio in CGD is vital. There are no immediate plans to formalize the student ePortfolio in the CGD program at Mason, but small steps toward incorporation have achieved faculty and student buy-in. Incorporating reflective ePortfolios into the CGD curriculum builds a shared habit of mind amongst students and faculty, resulting in improved instruction for professional preparation, enhanced intellection, and personal growth.

Currently, the evolution of ePortfolio in Mason’s CGD program can be broken down as:

- Faculty identified the necessity of ePortfolios for students entering the game industry
- Introduced upper division, one-credit pre-internship course requiring ePortfolio
- Added lower division, one-credit portfolio course to introduce ePortfolio earlier in curriculum
- Incorporated reflective writing/practice in required Writing Across the Curriculum course
- Continued assessment of ePortfolio’s effectiveness in students’ professional preparation and intellectual growth, watching for what comes next

This short piece offered a thumbnail sketch of Mason’s CGD program doing just that, employing concepts of ePortfolio a bit at a time. Institution-wide adoption of ePortfolio can be arduous, but faculty can still employ the same concepts and practices in programs and courses to enhance student learning and professional preparation. Even if a formalized, curriculum-wide adoption of ePortfolio may not be adopted soon, this ‘grassroots’ approach serves as a proof of concept for future efforts.

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Reflective practice in the sciences:
Being, thinking and doing in your ‘un’comfort Zone

by Patsie Polly
edited by Elaine Gray

Reflection and reflective practice is generally an uncomfortable space for scientists-in-the-making. This issue is usually due to the culture of learning, and what is valued within a discipline. For us scientists, the quest for knowledge acquisition and ‘the facts’ often bypasses the idea of reflecting on that knowledge once it’s acquired. So how does that culture begin to shift from concrete knowledge acquisition to not-so-concrete reflective practice? To address this issue, I realise that the language has to be modified according to each discipline. In science the art of collecting core facts and data then has to be interrogated using an iterative process that involves a type of tango between observation and critical thinking. This is metacognition for us scientists. What does it mean to be in your ‘un’comfort zone as a scientist? Once you ask us to analyse data, facts or artefacts, make sense of these, and network them to make a bigger constellation to reveal a deeper understanding of their meaning, only then do we actually realise that we have engaged in reflective practice or critical thinking as professional scientists. This is when we become comfortable again.

A process of developing reflective practice and addressing the ‘un’comfort zone issue was designed by integrating authentic assessment tasks focussed on research or clinical scientific learning into undergraduate course curricula at the University of New South Wales (UNSW) Sydney in the Medical Science degree program since 2012. Students were asked to reflect on their learning and skills development when performing these assessment tasks. The rationale for implementation of reflective practice using ePortfolio pedagogy was to instigate a process of iterative, integrative and self-directed learning of metacognition as well as raising awareness of professional skills development along the way.

As the 2016-2017 UNSW Teaching Fellow I have had the opportunity to engage colleagues across campus to facilitate ePortfolio pedagogy to build reflective thinking and doing. A major project aim was to develop and implement a system of embedding portfolio thinking and capturing reflective practice in Bachelor degree programs beyond Medical Science, to also include Exercise Physiology and Optometry/Vision Science at UNSW Sydney. These programs can be compared and contrasted for effects, including identity development and metacognition of skills acquisition across diverse science student cohorts. A blogging writing style that today’s students are comfortable
with and ‘expert’ in was initiated. Students were asked to blog about their course and assessment task experiences and what that meant to them. This technique merged the worlds of formal and informal writing styles to create UNSW institutional reflective assessment task activities for capturing reflective practice. The effect of infusing folio pedagogy, habit of mind and thinking across context and discipline can then be realised. The aim was to facilitate development of these thinking processes in context within courses and programs in order to encourage self-directed student learning and reflection on skills development.

The implementation strategy for enabling reflective practice related to various aspects of the course as well as specific assessment tasks aimed at developing teamwork and collaborative skills shown in Figure 1. Students were asked to reflect critically on their learning of skills or skills development upon and/or post engagement with various assessment tasks and blog about their experiences and make meaning of those experiences.

This cross-(science) disciplinary process on reflective practice capture using ePortfolio blogging was developed using a series of targeted questions as progressive semester activities to scaffold and introduce reflective practice and thinking for students. Students were prompted to reflect on various course aspects using these targeted questions online via Moodle by their course convenors throughout the semester (Figure 2). These prompt questions were approved for application by the UNSW Human Research Ethics Committee (ethics number HC15134).

Targeted questions included the following:

- **Reflection Prompt Question 1**
  
  *How will this course help you in your future career/studies?*
  
  Was implemented in week 1 of a 12 week semester.

- **Reflection Prompt Question 4**
  
  *How will you take what you have learned in this course beyond this year?*
  
  Was implemented in week 10 of a 12 week semester.

Reflective thinking and writing in response to these questions was captured using the Open Universities (OU) blog tool in Moodle (Figure 2). Students were asked to submit their blog entries to Turnitin in Moodle for originality checks and for evaluation using the Reflective Rubric UNSW which was developed as a key project outcome (Figure 2; Table 1). This process ensured consistency and also standardised marking of student reflections across all the courses within multiple degree programs by different assessors. The use of Turnitin was deliberate in this context to further develop and validate reflective blogging as an institutional assessment task by also allowing us as teachers to evaluate individual student originality and authenticity.

### Insights

Science undergraduates are usually in their ‘un’comfort zone when asked to write reflections on their learning experiences at university. This is understandable when we consider the nature of their scientific disciplines which are driven to focus on core content and concepts acquisition as well as data analysis. Given this notion, it was not unusual for science undergraduates to question the relevance of reflective practice. Indeed, as an undergraduate and post-graduate student, I also struggled with reflective practice.
Integration of ePortfolio pedagogy with assessment tasks that are authentic to the discipline and authentic in the skills to be developed for that discipline facilitates close coupling of academic/curricular knowledge and professional/co-curricular skills development. Asking students to focus on developing reflective practice in this context explicitly raises awareness of those co-curricular skills that underpin graduate capabilities and meaningfully links learning outcomes as part of how students prepare for future endeavours. This has been a useful way of engaging our science students into reflective practice.

‘Overall I really enjoyed this lab, especially with the utilisation of the virtual [virtual] laboratories that take you step by step thought processes and reasoning to why they conducted individual steps in the methods. For example, the way in which certain [mice] mouse models are used in different contexts and how researchers can induce these diseases in the mice, such as cachexia through the injection of c26 into this [mice] mouse to provide a model of the disease and to study it further is remarkable! It only begins to highlight the amount of work required to come up with this research, and as someone who is currently interested in undertaking an honours year, it has really helped me to visualize what kind of work researchers actually do.' (Student, 2015).

The use of prompt questions was also important for us as teachers as it aided us in the design process for enabling supported reflective practice. It gave the teacher a method for standardising reflective practice across courses at various stages within a program. Scaffold prompt questions were designed to capture students’ development of professional skills by completing certain assessment.
tasks, linkage between course content and external opportunities and transferrable of skills from one stage to the next.

‘...during my time studying science here at UNSW, I wasn’t given the opportunity for much group work. I was quite new in terms of working in a team and I thought my ideas were always right because up until now, my grades have been quite good. The research team task showed me a new side towards academics in which collaborating ideas, being open to new ideas and interacting with a common goal was important. I learnt a lot about my lack of teamwork skills and re-evaluated how I approached teamwork. I can happily say that I learnt to accept other ideas, negotiate and come up with strategies together to suit the team. This was perhaps the most enriching skill I learnt as collaboration is very important in science.’ (Student, 2016).

**Approach and Recommendations**

To engage students in reflective practice, a teacher-led approach was applied using a standardised series of targeted prompt questions such as those shown above, in Moodle. This was implemented in courses from years 1-3 across each degree program. The evaluation of reflective blog entries was developed (Table 1, Reflective Rubric UNSW; a key project outcome). A mechanism for capturing and extracting data in order to quantify skills development and recognise emerging capabilities that link back to student reflections on learning within ePortfolios was then applied. This rubric system is used to grade assessment tasks focussed on teamwork across years 1-3 in each degree program. These tasks have been aligned with graduate capabilities and reflective practice. Indeed, a recommendation for colleagues seeking to capture, evaluate and ‘quantify’ student reflections would be to apply a standardised approach to prompting reflective practice coupled with use of a rubric such as the Reflective Rubric UNSW. Data capture and quantification would then have use in various applications related to evaluating graduate attribute development, skills awareness recognition and badging over time and throughout a degree program.

The decision to use the institutional learning management system blog tool as an ePortfolio platform was a requirement that I recognised for maintaining confidentiality from public view throughout this project and beyond. This thinking arose from my own reflective practice and experience when working with confidential research findings and materials. Limitations of using an institutional system might result in student reflective blogs that are not authentic. Authenticity may be compromised for two reasons. These include writing what the teacher may like to read and writing less restrictively in terms of confidentiality. These issues would be overcome as students gain experience in reflective practice and understand the community of practice in their discipline.

**Outcomes**

A process on reflective practice capture using ePortfolio blogging across different science degree programs at UNSW Sydney has been developed. This process scaffolds students into the practice of reflection by using targeted questions as progressive semester activities and may be applied within any ePortfolio platform. This approach explicitly aligns curricular to co-curricular learning in order to facilitate deeper reflection by asking students to think about their learning experiences and integrate that thinking in the context of professional skills development and communicate them in a written context. As a university teacher, this is what I would reflect on as the ‘un’comfort zone for science students. It’s uncomfortable for this student cohort as they now become accountable for their personal-professional reactions and thinking.

This would be a very individual experience for each student and reflective practice capture is a way of visualising what students have understood in the broader context of their learning, self-efficacy, identity and professional thinking for their future endeavours.
By doing so, students could transition from their ‘un’comfort zone into their comfort zone. Importantly, this approach would be a way for implementing reflective practice assessment tasks that could be formally marked in a curricular setting.

**Things to look out for**

The process of developing confidence in reflective practice for science students evolves most easily as part of their association with thinking within discipline. This coupling of discipline thinking to develop self-awareness underlies identity formation. Once students are comfortable with the notion that they can think and do as scientists they move beyond the bottleneck of becoming a scientist into being a scientist. This is the point at which students take ownership of their thinking and experience and then have the confidence to apply that to a new action, direction and process. With increased confidence in reflecting on their learning and capabilities, students can connect their experiences and make judgements both within discipline at university and externally in their personal professional world.

**Conclusion**

Our findings show that students are able to engage in reflective practice within ePortfolio thinking when supported and enabled with as a series of prompt questions that require students to think about co-curricular professional skills awareness and learning when coupled to curricular learning.

**Acknowledgements**

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**Patsie Polly** is an Associate Professor in Pathology, with expertise in authentic assessment, course and program-wide ePortfolio implementation/use within the science-based degree programs at UNSW Sydney to facilitate student reflective practice and professional skills development. Patsie has led ePortfolio use and implementation by engaging academic colleagues as a UNSW lead and invited investigator on cross-institutional projects addressing teacher professional development. Patsie has been recognised with multiple institutional/national teaching awards and invited institutional/national/international presentations and peer-reviewed research outputs in research communication and ePortfolio use. Patsie has attracted institutional/national funding to support development of eLearning resources and is a UNSW Teaching Fellow.
**Reflective practice in the sciences**

**Patsie Polly**

### Reflective Rubric UNSW

<table>
<thead>
<tr>
<th>General Prompt Questions</th>
<th>Levels of Capability Attainment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>How will this course help you in your future career/studies?</strong></td>
<td>No response submitted or prompt question was not addressed.</td>
</tr>
<tr>
<td><strong>Reflect critically on using an ePortfolio/Reflective blog for your overall learning in this course</strong></td>
<td>No response submitted or prompt question was not addressed.</td>
</tr>
<tr>
<td><strong>Discuss which skills have you acquired that you didn’t expect to develop through this course.</strong></td>
<td>No response submitted or prompt question was not addressed.</td>
</tr>
<tr>
<td><strong>How will you take what you have learned in this course beyond this year?</strong></td>
<td>No response submitted or prompt question was not addressed.</td>
</tr>
<tr>
<td><strong>Assessment Specific Prompt Questions</strong></td>
<td>No response submitted or prompt question was not addressed.</td>
</tr>
</tbody>
</table>

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Piecing together the puzzle:
ePortfolio as a means of reflective study

by VICKI SNYMAN

edited by Dr. CHRISTA VAN STADEN

I enrolled in the Postgraduate Diploma in Tertiary Education (PDTE) at the University of South Africa (Unisa) in order to develop my teaching repertoire and to gain knowledge and skills to become a more qualified educator. The course consisted of five interconnected modules, which had different assessment procedures. One of the modules, Instructional Techniques and Multimedia in Adult Education (INTMAEU), piloted eportfolios as a method of alternative assessment. Instead of writing summative examinations at the end of the year, we created eportfolios using the Mahara eportfolio system. In this autoethnographical report, I reflect on the eportfolio I produced to showcase my learning, growth, and development.

The INTMAEU module focused on ensuring educators are knowledgeable about how teaching methods and media facilitate effective learning. Various technologies were integrated to assist learning and increase learner involvement and cooperation in distance education. As such, a summative examination would not have been sufficient to demonstrate our ability to integrate technology into the classroom. Instead, the module followed a learning-oriented approach to assessment (Van Staden, 2016a). The assignments were regarded as learning tasks; therefore, we were required to improve on our work by incorporating feedback from the lecturer and peer review of our eportfolio from fellow students. In addition to reflecting on external feedback from peers and the lecturer, we were required to reflect on our own learning journeys.

The reflective eportfolio I developed highlights how reflection served as an essential and fundamental foundation of the learning process. The research method I employed will be discussed in the next paragraph.

RESEARCH METHOD

Ellis, Adams and Bochner (2011) defined autoethnography as a research method that describes personal experience in order to investigate cultural experience, a procedure that is both “process and product”. In light of how eportfolios themselves can be considered as process and product, it is fitting that I employ this research method to explore the
learning journey that took place over the months that I completed the INTMAEU module. Furthermore, Ellis et al. (2011) pointed out, “the author does not live through these experiences solely to make them part of a published document; rather, these experiences are assembled using hindsight”. As such, I will use the material I gathered to complete my eportfolio as well as my eportfolio itself to assist with constructing my recollections of the impact of reflection on my learning process. A copy of my eportfolio, originally created on Unisa’s Mahara platform, is available at Arendsig Akademie.net. In addition, I produced a video providing an overview of my eportfolio for Dr Christa van Staden, the lecturer responsible for designing the INTMAEU module, who has used the video in two of her articles to date (Van Staden, 2016a, 2016b). This video was shared on a blog I initially created as a personal way to document my progress through the module.

Ellis et al. (2011) stated “[w]hen researchers do autoethnography, they retrospectively and selectively write about epiphanies”, which they subsequently examine using theoretical tools, methods, and literature. One of the primary ‘epiphanies’ I had during my studies was the value of reflecting on experience as a means of learning through integrating knowledge and experience. It is because of this understanding that I will focus on the value reflection brought to my learning journey. The purpose of this autoethnography is to provide a highly personalized account of the power of reflection during the development of eportfolios. I will define the concept of ‘reflection’, before exploring how reflection enhanced my learning experience during the creation of my eportfolio.

**What is reflection?**

The foundation of learning is understanding the relationship between experience and ideas, a conclusion drawn from Mezirow’s (1990) definition of learning: “the process of making new or revised interpretations of the meaning of an experience, which guides subsequent understanding, appreciation and action”. Furthermore, it is reflection that enables this process to take place, as Moon (2004) succinctly stated: “[r]eflection lies somewhere around the notion of learning and thinking. We reflect in order to learn something, or we learn as a result of reflecting.” Boud, Keogh, and Walker (1985) described reflection as a process in which learners “recapture their experience, think about it, mull it over and evaluate it”.

It is an exploration of these personal experiences that “leads to new understandings and appreciations”.

However, it is not enough to only consider one’s own experiences and interpretations of literature about a topic. It is also necessary to engage with peers and lecturers about various topics in order to confirm experiences, correct misinterpretations, and develop new thought processes in light of new information and experiences. Grabinger and Dunlap (1995) claimed that “[l]earning is a collaborative process. Students learn not solely from experts and teachers, but also from each other. They test ideas with each other and help each other build elaborate and refined knowledge structures.” Similarly, Rodgers (2002) reiterated Dewey’s point that reflection “needs to happen in community, in interaction with others” and related her own teaching experience in which she highlighted three significant benefits of collaborative reflection: verification of experiences had, considering things in a new light, and emotional and intellectual support through the learning process.

For the purposes of this article, reflection can be defined using the following core concepts.

1. Reflection is an essential tool for connecting ideas and experience into an integrated whole.
2. Reflection begins with self-reflection.
3. Reflection is collaborative and communal.

The primary goal of reflection is intellectual growth; consequently, students need to be provided with multiple opportunities to reflect on their own work and the work of their peers. In this paper, I report from the perspective of a student on the value of reflective eportfolios in distance education.
The value of reflection during eportfolio development

Reflection connects theory and practice

Reflection is an essential tool for connecting ideas and experience into a cohesive whole. Rodgers (2002) stated that reflection is a “meaning-making process that moves a learner from one experience into the next with deeper understanding of its relationships with and connections to other experiences and ideas”. In the module, each assignment was designed with the intention of integrating theory into practice. I had to connect teaching theories and methods, media and technology, and assessment tools into everyday teaching practice. I reflected on the different and interconnected facets of the teaching and learning process, particularly in the construction of my eportfolio. In all assignments, I collected a variety of artefacts to include in the eportfolio. Assignments were displayed as works in progress and as final products. In this way, theory and practice worked together in a spiral of knowledge creation and representation.

The first assignment required us to examine a variety of learning theories and select two to explore in greater detail with a primary focus on considering the practical application of learning theories.

The mind map (figure 1) I created using coggle to demonstrate my writing process illustrates the criteria I used to compare and contrast behaviourist and experiential learning theories.

Please note that hyperlinks are attached to all references to figures used in this paper and can be clicked for enlarged views. In addition to the mind map I created for this assignment, I designed graphs (figure 2) to illustrate the cycles of learning defined by each of the learning theories I discussed.

<table>
<thead>
<tr>
<th>Behavioural Learning</th>
<th>Kolb’s Cycle of Experiential Learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>(A) Antecedent</td>
<td>Reflective Observation</td>
</tr>
<tr>
<td>(B) Behaviour</td>
<td>Concrete Experience</td>
</tr>
<tr>
<td>(C) Consequence</td>
<td>Active Testing</td>
</tr>
</tbody>
</table>

Figure 2: Graphs illustrating behaviourist and experiential learning cycles of learning.

At the end of every assignment, I shared a word cloud I created using Wordle, which served an aesthetic function as well as a graphic representation of the most commonly used words and ideas in each assignment. Figure 3 is an example from the first assignment.

In second assignment, I adapted a class to be delivered online as an e-class, since we had to implement a new instructional technique and reflect on the advantages, disadvantages, and limitations, as can be seen in figure 4.

This assignment was particularly successful in fostering the practice of reflecting on the strengths and weaknesses of the teaching methods and media I employ and how best to cultivate a rich learning environment. Moreover, my teaching repertoire has been vastly improved and expanded due to the skills and techniques I learned while developing my eportfolio. I was challenged to try multiple new technologies for the purposes of creating a lesson to be delivered online, such as creating my own video for the first time. I wrote the script, filmed, and edited this video and shared it on YouTube. I had a great deal of practice using Microsoft
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Behaviorist vs Experiential Learning Theories

Figure 3: Word cloud for INTMAEU assignment

Instructional Methods

Figure 4: Instructional methods mind map created using coggle.
PowerPoint to create images, graphs, worksheets, and presentations; however, I had not used Adobe Photoshop before creating images such as illustrated in figure 5 for this assignment. The skills I gained while creating images, presentations, and videos for my eportfolio have enhanced my teaching practice since I can design my own images for worksheets and handouts and create my own videos for blended, hybrid, and e-learning purposes.

The third assignment explored the use of instructional media and technology in the classroom. This assignment was more intensely focused on incorporating technology into the teaching plan. However, my teaching experience in different countries became a crucial consideration that extended the nature of the assignment. I began by reflecting on how more affluent working situations had far more access to technology than particularly the developing world of South Africa. I researched access to technology in sub-Saharan Africa, the effect of the digital divide on learning, as well as the problems of adequately equipping educators to use technology to educate students. This process of self-education external to the confines of the course began with the reflective process of writing my self-reflective blog about this assignment. This demonstrates how the self-reflective blog posts enabled the development of self-direction and lifelong learning as an active practice.

The fourth assignment involved assessing learning materials, curricula, instructional techniques as well as student achievement of learning goals in order to improve on the education process, as is outlined in figure 6.

It was necessary to relate theory to practical demonstrations and to ensure a seamless connection between different aspects of the lesson. Within my teaching practice as well as my own learning processes I have developed the practice of considering how the education process will work before the learning experience, how it is working during the experience, and how effective the process was after the learning experience.
experience. Figure 7 aptly encapsulates the principle of the reflective eportfolio that is embedded in many facets of the module and is a fitting description of my reflective activities.

The sixth assignment involved writing a paper about one of the topics covered to be presented at a fictional conference about open distance e-learning. This assignment provided concrete experience for students to engage in academic practice, for which I created a video about Technology and Distance Education. We were given a time limit of five minutes and five slides for this presentation, which meant that I could only provide a brief and superficial introduction to the use of technology in distance education. I designed the images for this presentation, created the presentation, recorded the audio, and made the video using Microsoft Powerpoint.

The use of an eportfolio as an assessment tool was extremely effective since links to websites, images, videos, and other artefacts could be displayed. In addition to this, I reflected continuously on the topics covered and how theory connected with daily practice throughout the different stages of the eportfolio construction.

**Reflection begins with self-reflection**

Lew and Schmidt (2011) explored different definitions of self-reflection and concluded that they “share similarities in that they stress purposeful critical analysis of knowledge and experience so as to achieve deeper meaning and understanding”. The INTMAEU syllabus integrated self-reflection as an essential tool for furthering the education process. I will focus on two of the formal ways that self-reflection was introduced, namely self-reflective blog posts, which were written after the completion of every assignment and a self-assessment test.

**Self-reflective blogs**

Lew and Schmidt (2011) described reflective journals as “essentially written records that students create as they think about various concepts learned, about critical incidents involving their learning, or about interactions between students and teachers, over a period of time for the purpose of gaining insights into their own learning”. This practice of self-reflection was built into the foundation of the module. After completing each assignment, we had to write a blog post reflecting on the assignment and how it connected with the body of teaching theory and teaching practice. In this way, knowledge was transferred from one learning experience to the next. Rodgers (2002) stated that the purpose of reflection is “to make meaning: to formulate the ‘relationships and continuities’ among
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the elements of an experience, between that experience and other experiences, between that experience and the knowledge that one carries, and between that knowledge and the knowledge produced by thinkers other than oneself.”

When I examine the self-reflective blog posts that I wrote, I can clearly see how I connected my own teaching practice with the theories I examined not only in this module but in all the modules of the PDTE course. I include here a quote from the reflective post I wrote after the completion of the first assignment:

“I need to have a dual focus: the daily practice of teaching, as well as creating and contributing toward a theoretical body of knowledge. As de Vos and Strydom (2011:43) argue, the purpose of professional research is not only the solving of practical problems applicable to a specific practice setting, but also the forging of a genuinely indigenous theoretical base. In order to be a successful educator, I need to balance these two tasks: developing my teaching methodologies, techniques, and educational paradigms, and adding to the existing body of knowledge. This assignment in which I compared two learning theories provided a practical foundation on which I can consider ways of improving my practice and reflecting on existing theory, and perhaps even consider new avenues of research in which I can potentially give to the existing body of knowledge.”

It is also in my reflective blog posts that I engaged with different theories, and considered what I thought about various topics. For example, in my reflection on the fourth assignment about assessment tools, I considered different definitions of assessment and developed my own viewpoint that did not merely coincide with what was presented in the primary text. Moreover, I questioned how assessment is currently used by many educational institutions. In this way, reflection enabled a transformative process. The nature of the self-reflective blog allowed me to engage with theory on a personal level. Instead of just accepting literature and regurgitating ideas (which would have been sufficient for a traditional summative exam), I began to question, challenge, and develop my own ideas in relation to the literature I was consuming.

My reflective blog posts reveal that I was not uncritical of the eportfolio process. For example, in my reflection on the assignment in which the class created a glossary of terms used throughout the module, I evaluated the nature of the assignment and the quality of the work produced. The assignment was meant to be a collaborative project in which we defined terms and critiqued each other’s work in order to create a valuable resource, in which we constructed knowledge and meaning together, instead of passively accepting definitions provided by the literature we were reading. I, however, did not feel that the project was really conducted as a group. I commented as follows:

“Despite the fact that this was meant to be a group project, I did not really feel like I was working with anyone at all. I researched my five words and shared them under the glossary section on myUnisa, without consulting or discussing anything with anyone. There is very little continuity and connection between the various words, everything was done by random people acting as individuals.”

I also queried the validity of the work we produced and concluded that I would rather consult “published work that has gone through a more rigorous editing and checking process”. In addition to this, I considered ways I could implement a similar project in my own teaching practice and how to address the problems I had faced while completing the assignment. It is here again that the true value of the learning experience is only attained through reflection, since it is only when I considered the learning experience that I evaluated the learning that had occurred, examined the product that had been created, and contemplated ways of improving both the learning process and the end product in future learning experiences.

Similarly, it is in my reflection on the discussion assignment in which we examined a variety of topics related to the module that I explore the valuable aspects of the learning experience as well as the ways in which the assignment could have been improved. The self-reflective blog enabled me to critically investigate the learning process and assess what was and was not working. It allowed me to engage with the module and to become an active participant in the learning process, rather than just a passive recipient of information. In addition to the reflective blog posts, we wrote a self-assessment test in which we reflected on our learning journey.
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**Self-assessment test**

As adult learners, fostering an environment in which students gain the skills of assessing their own learning is crucial.

Knowles (1975) pointed out that learners who are self-directed and involved in the planning, implementing, and evaluation of learning experiences “enter into learning more purposefully and with greater motivation. They also tend to retain and make use of what they learn better and longer than do the reactive learners”.

The self-assessment test enabled me to reflect critically on the learning journey, and to assimilate past, present, and potential future learning. Moreover, different aspects of the learning experience were integrated, particularly the inclusion of learning that had taken place outside of the traditional formal learning environment.

During the self-assessment test, it was necessary to reflect on the module assignments themselves and what was learned through reading course material and completing assignments. I had to consider the knowledge and skills gained as well as challenges I had encountered while completing the module. The experiences I had outside of the module also needed to be included in the self-assessment process. I discerned that my work experience as a teacher in different countries had allowed me to develop interpersonal and soft skills that allow me to be flexible and adaptable to different circumstances. I also reflected on independent learning, the co-creation of knowledge that occurred through collaborative learning, and how I gave advice and suggestions to supervisors, lecturers, and peers. Finally, I reflected on the use of technology in both my teaching and my learning. It is through the self-assessment test that I appreciated how much of my learning took place parenthetically, and would not necessarily be evaluated. I include here a relevant comment from my self-assessment test:

“Incidental to my studies, I’ve learned how to film and edit videos, upload material to the internet in a variety of ways, create my own images in Photoshop, and create a variety of sound files to suit my needs and purposes. The technical skills I gained while putting my eportfolio together will be the most valuable to me in the future. I can integrate theory and practice together effectively, and showcase my technological skills to current and future employers, as well as enhance my lessons with the skills I’ve developed. Thank goodness I made a portfolio and did not write an exam regurgitating the already out of date textbook (it’s from 2011, so much has changed in the last five years!)”

This point is particularly pertinent, even after the completion of my course, since I currently use the skills I developed while completing my eportfolio to enhance my teaching practice. I create videos, audio clips, images, and worksheets that I use in my teaching practice on a regular basis.

However, it is not enough to reflect on one’s own work and consider one’s own interpretations of literature. It is also necessary to communicate and engage with peers. In the next section, I will explore the collaborative reflection that took place during the course of the year.

**Reflection is collaborative and communal**

Traditionally, the focus of educational practice has been to create competitive and individualistic learners. However, this is not necessarily the best way to create and develop solid knowledge bases. In an attempt to develop team working skills during distance education, collaborative and cooperative learning were core characteristics of the module. At the beginning of the module, we were divided into cooperative base groups (see Johnson, Johnson, & Holubec, 2008) with the intention of providing intellectual and emotional support to each other during the learning journey. The assumption was made that providing opportunities to develop cooperative learning
skills during the course of the year would have a positive impact on group work in distance education.

**Collaborative and Cooperative Learning**

There are many factors to consider when implementing collaborative and cooperative learning in a distance education environment. According to Race (1999), groups can be formed randomly using alphabetical lists, by carefully considering students' backgrounds and abilities, or by allowing students to form their own groups. In the INTMAEU module, we were divided into groups randomly based on an alphabetical class list. However, I developed a close working relationship with students from different groups. This group that developed organically and outside of the collaborative base group created by the lecturer provided the emotional and intellectual support intended by the official group. Moreover, I worked together with these students in other modules for the PDTE which did not have the same focus on student-oriented and collaborative learning practices that the INTMAEU module had. The process of group development is not always straightforward, and the human factor can have an unexpected impact on planned processes. This is an issue that needs to be considered when implementing collaborative learning, particularly in distance education.

Several of the assignments were built upon collaborative learning. Communal projects included generating a **glossary** of terms used throughout the course, co-authoring a **wiki** about one of the teaching methods learned during the course, and taking part in group **discussions**. We discussed six topics which complemented the objectives of the course. This activity developed frequently underestimated soft skills and cultivated an environment in which learning from the knowledge and experience of educators from different backgrounds was encouraged. The eportfolio platform was an ideal vehicle for providing this education method. I was able to reflect on the theories I studied, my own teaching practice, as well as the experience of educators with a vastly different history to my own.

Working collaboratively is increasingly becoming an essential skill in multiple areas. Developments in technology have resulted in new ways to produce, store, and share knowledge, which has had an impact on the purpose of education. As Cogburn (1998) pointed out, the “objective of education is no longer simply to convey a body of knowledge, but to teach how to learn, problem-solve and synthesize the old with the new.” Educators can no longer be viewed as the source of information disseminated to the awaiting learners. Rather, educators need to be seen as guides, aiding learners to navigate the multiple and varied sources of ever-increasing knowledge. In addition to the shift in relationship between educator and learner, there needs to be a shift in how learners engage with each other; therefore, educational approaches need to acknowledge the value of teamwork. Traditional educational models are focused on individual learning; learners are encouraged to “think only of themselves and their own personal development, perhaps with some very limited group work” (Cogburn, 1998). However, in a globalized world, there is an increasing focus on working in teams. This kind of work environment requires learners to “develop skills in group dynamics, compromise, debate, persuasion, organisation, leadership and management skills” (Cogburn, 1998). The inclusion of group work into the eportfolio enabled the development of skills necessary to work collaboratively and cooperatively.

**Peer Review as a Method to Encourage Reflective Practice and Cooperative Learning**

The eportfolio platform enabled peer review to be incorporated directly into the assessment process. Peer review as an assessment tool is a student-focused approach that initiates students into a practice which is arguably the heart of academia. It is necessary to introduce students to this system since all disciplines employ peer review to establish quality control over what is produced. We reflected on our own work, on each other’s work, and used peers’ reflections to continuously improve our work and eportfolios.

Participating in the peer review process assisted in the process of becoming cooperative learners. Sadler and Good (2006) discussed the affective advantages of peer review as an assessment tool and comment that “[a]ffective changes can make classrooms more productive, friendlier, and cooperative, and thus can build a greater sense of shared ownership for the learning process.” Additionally, involvement in the assessment process provided us with opportunities to develop the necessary skills required to be self-directed learners. Peer review is a valuable tool that assists learners develop the skills to evaluate and assess their own learning, which is essential in developing effective lifelong learners. Peer review allowed us to be active participants in the assessment process.
We examined weaknesses and strengths in each other’s work and provided constructive feedback. When I reviewed my peers’ work and received their comments, it provided me with multiple viewpoints and a wider perspective on the work produced. Sims (1989) commented “[s]tudent reviews add additional perspective to the review. When feedback is provided only by the instructor, students are passively involved in the evaluation process. Student passivity has been linked to ineffective learning in classroom teaching situations.” Moreover, peer review is an activity that fosters critical thinking.

Sadler and Good (2006) discussed how peer review supports the development of metacognitive skills. They review the work of a variety of scholars and conclude that including peer review into the learning experience has benefits that exceed “subject-matter content”: students take initiative in the evaluation process, use higher order thinking skills to evaluate peer work, and become aware of their own strengths and progress. Furthermore, “[s]elf-evaluation and peer review are an important part of future, adult, professional practice, and test grading is a good way to develop these skills” (Sadler & Good, 2006). Based on my own learning journey, I can clearly see that reflective eportfolios can be regarded as high impact practice.

**Reflective ePortfolios as High Impact Practices**

Watson et al. (2016) discussed how the Association of American Colleges and Universities (AAC&U) made the “evidence-based decision to expand its set of ten high impact practices by one” and included eportfolios as the eleventh high impact practice. However, Eynon and Gambino (2017) pointed out that not all eportfolio practices can be regarded as high impact. After my experience developing a reflective eportfolio, I suggest that reflective eportfolios developed within a learning-oriented approach to assessment can be regarded as high impact practice. In this section, I will discuss the characteristics of the reflective eportfolio development process that make it a high impact practice. A significant benefit in employing an eportfolio as an assessment tool is the development of lifelong, self-directed learners who have well developed metacognitive skills. In addition, I suggest that reflection is a metacognitive process that develops self-direction and lifelong learning.

**EPortfolios as a Method to Develop Self-Directed Learners**

Knowles (1975) defined self-directed learning as a “process in which individuals take the initiative, with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies, and evaluating learning outcomes”. It is the goal of educators to develop self-directed learners. One of the primary aims of the eportfolio implemented by the INTMAEU module was to ensure that we were actively involved in planning, implementing, and evaluating our learning journey.

**EPortfolios as a Method to Develop Lifelong Learners**

Lifelong learning, or lifelong education, is a concept that has become a governing force for many education systems. Dunlap and Grabinger (2003) commented that “lifelong-learning skill development is imperative if practitioners are expected to learn over the full expanse of their professional lives”. In the South African context within which I have completed all my studies, lifelong learning is an essential concept. Walters (1999) stated that “changes in South African society render it particularly important for the South African educational system to produce lifelong learners and to provide for continuing learning throughout life”. She further highlighted that the

“imperatives for lifelong learning in South Africa are driven by its reinsertion into the global economy and by the political and social necessities of equity and redress after the years of colonialism, segregation, and apartheid”.

**Imperatives for Lifelong Learning**

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**EPortfolios as a Method to Develop Lifelong Learners**

Lifelong learning, or lifelong education, is a concept that has become a governing force for many education systems. Dunlap and Grabinger (2003) commented that “lifelong-learning skill development is imperative if practitioners are expected to learn over the full expanse of their professional lives”. In the South African context within which I have completed all my studies, lifelong learning is an essential concept. Walters (1999) stated that “changes in South African society render it particularly important for the South African educational system to produce lifelong learners and to provide for continuing learning throughout life”. She further highlighted that the

“imperatives for lifelong learning in South Africa are driven by its reinsertion into the global economy and by the political and social necessities of equity and redress after the years of colonialism, segregation, and apartheid”.
The eportfolio process I completed facilitated an environment in which the principles of lifelong learning could flourish.

**EPortfolios as a Method to Develop Metacognitive Skills**

The eportfolio as an assessment tool fosters an environment in which lifelong learning can seed and grow. One reason for this is the focus on self-directed learning. As Dunlap and Grabinger (2003) suggested, “in order to prepare students in higher education to be lifelong learners we must develop their capacity for self-awareness, metacognitive awareness, and disposition toward learning”. Metacognition can be defined as “people’s knowledge of their own learning and cognitive processes and their consequent regulation of these processes to enhance learning and memory” (Ormrod in Merriam, Caffarella, & Baumgartner, 2007). Adult learners should be encouraged to use metacognitive skills for a number of reasons. Metacognition involves learners becoming aware of their own learning processes, the kinds of learning that are most suitable, and the best environment under which learning can occur most effectively. In addition to ensuring the most successful learning process, metacognitive skills provide the necessary tools for adults to become self-directed, lifelong learners. Adult learners need to engage actively in the learning process in order to ensure that it can be successful. This involves planning how to approach a learning activity, understanding the activity, and ensuring progression and integration of the learning experience. It is also essential that adult learners reflect on the learning experience and establish whether the outcomes of the learning activity have been met. I suggest that the use of reflection in the eportfolio I created supported the growth of these skills.

**EPortfolios as a Method to Encourage Improvement**

The primary aim behind using an eportfolio as an assessment tool for the module is intellectual growth, with a cycle of reflection and improvement at the heart of the learning process. This module fostered an environment in which reflection was a necessary and fundamental part of the learning experience. The portfolio was both a showcase for learning as well as a vehicle for learning; therefore, feedback from the lecturer was immediately incorporated into the learning experience and used to improve assignments. In addition, reflection was a collaborative effort, since students not only worked together to create learning products, we also critically reflected on each other’s work, offering suggestions and support to improve the overall eportfolio.

**Concluding Thoughts**

In order to learn, students need space and time to reflect and think. Reflecting actively on learning as was practiced as part of the eportfolio, enabled an effective process to link theory and practice, and make connections between the material learned and the context in which the learning will be applied. After being exposed to various assessment approaches employed in the PDTE, I believe I am in a good position to argue that reflective eportfolios are the best approach to develop lifelong learners since reflection was integrated into the learning process in a meaningful and constructive way. The combination of self-reflection and reflection on peer and lecturer perspectives to review the work completed enabled a holistic and student-oriented learning framework for creating an eportfolio that portrays learning, growth, and development. I conclude with a statement I made in the accompanying video and referred to by Van Staden (2016a, 2016b).

Completing the Instructional Techniques and Multimedia module was a lot like piecing together a jigsaw puzzle. At first, everything was a jumble of vaguely connected colours and shapes. As I worked through the material however, I began to recognise the patterns and how the different aspects of the course connected into an integrated whole. This eportfolio showcases my learning journey and is a powerful way to demonstrate my ability to fuse instructional techniques and media.

**Acknowledgements**

I would like to acknowledge the support Dr Christa van Staden has offered me, not only in this article but throughout her time as my teacher. She has provided me with many opportunities and has encouraged me to dig deeper and to extend my comfort zone. She is always prompt and communicative, and provides academic counselling, helpful advice, and emotional support as
I engage with new ideas and experiences. Thank you for taking the time to support me and guide me on my learning journey.

Vicki Snyman (Johannesburg, South Africa) is at the beginning of a hopefully long career in the education industry. After completing a Master of Arts in English, she started teaching full time in 2011 and has taught and lectured at various institutions in South Korea and Oman.


Adding meta-reflections

by Russel Stolins
edited by Diane Holtzman

This article describes an approach in which students write a new reflection drawing conclusions from artifact reflections written previously. I call this a meta-reflection (after the concept of meta-data; data about data). I had been teaching students ePortfolio skills for about three and a half years before coming up with this idea. The concept of meta-reflections has seemed so obvious to me since then, I wonder why I hadn’t thought of it previously. Before discussing this assignment, I’ll offer some context about ePortfolio practice at the Institute of American Indian Arts (IAIA).

DEFINITION

Reflection is the process by which a learner looks back and writes comments that plumb an assignment for additional insights. Reflections are an essential element in a well-formed ePortfolio artifact (Kahn, 2011). Reflections can be unstructured (a simple paragraph describing work on the assignment) or structured with multiple prompts on specific aspects of the assignment. Reflections encourage students to be active learners, looking to discover new lessons from an assignment. Reflections transform an ePortfolio from a commonplace online display of coursework into an accurate portrait of the student as a learner. The quality of a learner’s reflections is a significant indication of the seriousness with which a learner takes her/his education.

ABOUT IAIA

IAIA is a small arts college located in Santa Fe, New Mexico. Part of the Tribal College system, IAIA is devoted specifically to the teaching of contemporary Native American art—the only such institution of higher learning in the world with this mission. Its board of trustees is
appointed by the President of the United States. In addition to Studio Arts, IAIA offers degree programs in Cinematic Arts and Technology, Creative Writing, Museum Studies, Indigenous Liberal Studies. The student body is approximately 70% Native American (Martinez-Anaya, 2017).

**ePortfolio Course**

IAIA offers a 1-unit ePortfolio course that is required of degree-seeking students during their 2nd or 3rd semester. Here, students learn how to create an ePortfolio and well-formed artifacts. The structure for artifacts has been standardized throughout our programs and campus. So once students learn how to create artifacts, they can create them for any course in any program.

**Skills and Platform**

The course teaches technical skills with website creation, photography, image editing, and self-presentation/interviewing. After using Wordpress for ePortfolios the past five years, IAIA recently began transitioning to the Digication platform. Digication promises to give better access to ePortfolios and their evidence than was possible previously. Although students could be incredibly creative with Wordpress, escalating security woes and its disconnect from our campus systems became unacceptable trade-offs. Paul Wasko was right. Wordpress doesn’t work for large-scale ePortfolio implementation. (Schaffhauser, 2014)

**ePortfolio Reviews**

An assignment in this course, near the end of the term, students undergo an ePortfolio review. In an interview with faculty from their degree program, students present their ePortfolio artifacts. The review serves to welcome students formally into their degree program. The ePortfolio review is also an excellent opportunity for students to introduce themselves to faculty. For example, to describe creative and academic goals for their degree program and their post-graduation intentions.

**Artifact Types and Elements**

In 2013, IAIA adopted a set of campus-wide artifact standards. This ensures that student artifacts are consistent, easy to review, and comprehensive. The entire structure is based on several artifact types and reflection elements. Once a student becomes familiar with creating an artifact

<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course</td>
<td>Course ID, term, instructor</td>
</tr>
<tr>
<td>Description</td>
<td>Dimensions, media, resolution, software used for the assignment.</td>
</tr>
<tr>
<td>Assignment</td>
<td>What the student was asked to create or write.</td>
</tr>
<tr>
<td>Intent</td>
<td>The student’s creative or academic intent as she or he worked on this assignment. What the student was trying to accomplish.</td>
</tr>
<tr>
<td>My Critique</td>
<td>The student’s personal assessment of what worked, or didn’t work in the final piece. This could include ideas of what the student would change, or how she or he might try to create a similar work in the future. This element can also contain comments on aspects of the assignment that the student considered particularly successful.</td>
</tr>
<tr>
<td>What I Learned</td>
<td>What the student learned from working on this assignment. The student describes specific skills and/or insights gained. These insights are potentially useful in future projects.</td>
</tr>
<tr>
<td>Excerpts and Commentary (academic/creative writing)</td>
<td>In writing artifacts, students include two or three passages from a larger work, such as a piece of fiction or academic writing. Each passage is preceded by a brief commentary indicating its location in the work and the role it plays.</td>
</tr>
</tbody>
</table>
for a course, she or he can do so for any other courses in their program.

**Link to campus ePortfolio artifact standards**

**ARTIFACT TYPES**

IAIA defines specific artifact types for its ePortfolio practices. This enables students to use templates with specific prompts.
- 2D/3D Art (painting, drawing, sculpture, ceramics, jewelry, printmaking, etc.)
- Digital Art (images, video, audio)
- Writing (academic and creative)

**REFLECTION ELEMENTS**

IAIA uses a structure of prompts for artifact reflections. This requirement gives artifacts a useful consistency and comprehensiveness. While some students limit their reflection for each element to a sentence or two, many write more substantial reflections than they would without the prompts.

**ADDING META-REFLECTIONS**

In a meta-reflection, learners review previous artifact reflections and make new connections to their learning process. Just as meta-data is data about data, meta-reflections are new reflections based on past reflections. In a short essay of about two paragraphs, students describe the types of assignments and approaches to teaching that help them learn most effectively.

**Reflecting on teaching approaches**

Students reflect on approaches to teaching that help them learn best. For example, to consider group projects, visual examples, readings or videos, and the pre-planning of work on an assignment. The statements below also come from second- and third-semester students.

I thrive with teaching that includes plenty of images and visual aids. When I can see something, I can analyze it better, I also remember things very clearly. With this I can create art in a more efficient way since I can visualize pieces fully in my mind before I even begin to sketch or make it. I also like the hands-on approach. Working with a physical object and figuring out how it works and how I can make it work for me is my favorite type of learning. – Studio Arts student

I love a calm and reassuring teaching method because that rubs off and eventually I don’t need to be told anymore because I know how to do this and pull off that and planning things in advance because I become mentally prepared so I don’t stress. But I actually like getting stressed out too, because my body and mind rise to the occasion.... – Studio Arts student

**Reflecting on assignment instructions**

Students consider assignment instructions that helped them learn most effectively. For example, assignments where they pick the topic, or when they were given very specific instructions (or conversely, non-specific instructions). The quotations below are from students in their second or third semester of a program.

The types of assignments that work best for me are ones that have clear instructions and explain how to complete the assignment correctly. I feel like some times, teachers make the instructions too vague, and then make me confused on how to pursue the assignment. It helps a lot when the teacher lays out the tools, explains how to use them, and leaves it up to the student to create something from the tools. – Cinematic Arts student

Reflecting on past projects, I have realized I learn well when I am given freedom for creativity and wiggle room for my own interpretation. When I am given a project or assignment there are certain aspects that must remain up to me to decide. I cannot have too many guidelines to follow and hinder my vision. – Studio Arts student

**Benefits**

Students have enjoyed this act of meta-reflection more than I expected. Even students who don’t necessarily enjoy writing tend to write a thoughtful short essay of
one or two paragraphs. And some students go further, looking in close detail at their strengths and weaknesses as learners. For example, some students write about how they fare when approaches to teaching are used that don’t match their preferences, or when their own tendencies inhibit learning, such as procrastination. In nearly every short essay, students articulate and discover truths about themselves as learners.

**Conclusion**

Creating meta-reflections from ePortfolio artifacts has proven a useful exercise. Students discover more about themselves as learners. Their teachers can discover learning styles and approaches to formulating assignments that better engage their students. As the use of ePortfolio expands to more programs on our campus, I look forward to using meta-reflections with second-, third- and fourth-year students; asking them how the ways they learn best may have changed since their first year.

Russel Stolins, MA is a staff member of the Academic Technology department at the Institute of American Indian Arts in Santa Fe, New Mexico. He manages (and evangelizes for) the ePortfolio program at IAIA. He also works with faculty to incorporate technology into online and classroom courses.


A roadmap to digital ePortfolio proficiency:
Creating the conditions for cross-course, cross-program and cross-life professional learning

by Nicola Walker, Tim Hopper, Hong Fu and Kathy Sanford

edited by Andrew Harver

This paper will highlight the emerging pedagogical practice in teacher education utilizing a digital electronic portfolio (DeP). We have viewed our current practice in the use of ePortfolios as more than “electronic” (i.e., more than simply a collection of digital artifacts compiled by the user). We see “digital” as signifying access to the ever-growing resource of digital artifacts (i.e. websites, videos, papers, blogs, cloud-based apps) related to a teacher’s professional practice. The “digital” signifies the connecting, curating and re-presenting of this “digital” knowledge through an DeP hub. As Dannenberg et al (2016) state, “....an ePortfolio is more than a simple tool. Rather, it is a pedagogy that focuses on process and product, assists with metacognition, and increases student involvement in their own education” (p. 35). The focus of this paper is to explain how 35 students in their first professional term in a four-year bachelor of education course learned to reflect on their experiences in courses, in the program and across their lives as they formed their teaching identity. The paper represents a report on the teaching processes that have developed in an educational technology course that fosters digital literacy skills whilst creating a DeP. In this pedagogical approach, a key aspect was how to address the recurring challenges for teacher candidates (TCs) to develop an DeP related to: 1. low digital literacy skills resulting in resistance to learning a new software application; 2. fragmentation of learning across courses in a professional program; and 3. challenging ingrained experiences of grading systems used to value student learning (Hopper & Sanford, 2010; Hopper, Sanford, Fu, & Monk, 2016). We start from a literature review on the connection between ePortfolios and reflection with the aim of understanding how reflections triggered by digital rich media can help to create the conditions for learning in the DeP process. Using the metaphor of a roadmap, we then describe our institutional context in which we currently utilize DePs and the mechanisms that we have created to assist students in the creation of their DePs. Focusing on course observation and instructor insights we also describe the common processes students experienced when constructing their DePs. We then conclude with a summary of how instructors can utilize DePs to create conditions for cross-course, cross-program and cross-life professional learning for students.

Reflection in ePortfolios
Reflection has been considered a purpose, as well as theoretical underpinning, of creating an eP (Genc &
In this paper we see reflection as a process of coming to know oneself as a teacher. In relation to an ePortfolio (eP), reflection “enables students to document and track their learning; develop an integrated, coherent picture of their learning experiences; and enhance their self-understanding” (Rickards et al., 2008, p. 34). Through reflective writing students integrate their forming teacher identity with evidence of their expertise that emerges from actions related to the competencies of being a teacher. Therefore, agreeing with Jay and Johnson (2002), we consider “reflection [as] a process, both individual and collaborative, involving experience and uncertainty. It is comprised of identifying questions and key elements of a matter that has emerged as significant, then taking one’s thoughts into dialogue with oneself and with others” (p. 76), in order to act with more thoughtful commitment and ethical intent. In this way reflection is seen as an emergent process of bringing into relationship past, present and forming experiences, with others who have commitment to the task of becoming a worthwhile teacher.

Reviewing eP literature, Chatham-Carpenter, Seawel and Raschig (2010) listed reflection as one of the four major purposes of eP, the others being demonstration of career skills, aiding program review and assessment, and showcasing professional standards. They commented that “(l)earning through reflection provides the students with a powerful, lifelong skill applicable to all facets of life” (p. 438). Scholars such as Light (2016) further explained that ePs are commonly understood as most impactful when they possess evidence of “some reflective process or folio thinking” (p. 6). In regards to teacher education, Strudler and Wetzel (2011) noted that the eP has become a critical component to support TCs’ reflective practice. Karsenti, Dumouchel and Collins’ (2014) review of ePs in teacher education acknowledged that reflective practice is a “mandatory professional competency” in many initial teacher education programs and “an important component” in accreditation of teachers (p. 3488). The same authors also observed that multiple eP scholars have shown that an eP process “enables students to take a step back and adopt an objective, critical attitude toward their development of competencies and professional practices” (ibid, p. 3488). Similarly, Masters’ (2013) review of eP research acknowledges that the eP is “a mechanism to support authentic reflection” and “a tool to underpin self-regulated learning” (p. 3).

Students have reported positive effects of ePs as a mechanism to facilitate reflection. In Chatham-Carpenter et al.’s (2010) large-scale survey of 108 institutions of higher learning, the use of ePs to reflect on learning was one of the most common benefits reported by the survey participants. In particular, ePs “can encourage a student to take ownership of his/her learning” by “helping one make connections between courses, between academic years and between learning in the classroom and learning in the workplace and community settings” (pp. 441-442). In this way, ePs helps students to view their learning more holistically. Similarly, Wakimoto and Lewis’ (2014) research discovered that “overall, the students found the construction of their ePs to be useful and helpful in reflecting on their competencies and in gaining confidence in using technology” and that “(t)he creation of eportfolios can aid in student reflection on their professional development and growing competencies throughout the program” (p. 55).

However, some eP scholars have also raised concerns about the quality of reflection in current eP practices. For example, Thomas and Liu (2012), reporting on a grounded theory analysis of prospective teachers’ online reflections in an eP system, discovered that prospective teachers tend to showcase or “sunshine” their teaching and learning experiences rather than reflect on them analytically and critically. They therefore suggested that authentic reflective processes must be better supported in online eP.
systems. Also, Faulkner, Mahfuzul Aziz, Waye and Smith’s (2013) multi-disciplinary research showed that not all students were able to connect activities or reflect on their development and that the relatively low level of reflection and personal development planning of learners remains a challenge (p. 884). Therefore, reflection cannot be taken as automatic with the implementation of ePs. This paper describes the process we developed using the metaphor of a “roadmap” to explain how we guided TCs in creating their DePs, which enabled their genuine and authentic professional reflection.

Institutional Context

Since the use of DePs began in various teacher education courses at our institution, instructors have been informally noting: 1) how TCs creatively constructed their DeP; 2) the digital literacy skills required for such construction; and 3) the processes of reflection and professional identity formation that TCs experienced throughout the construction process. Elsewhere, we have analyzed theoretically and empirically our position in using DePs as a vehicle to better integrate theoretical and practical understandings of learning and teaching as novice professionals learn to think from narrative, paradigmatic and systems perspectives (Hopper, Sanford & Fu, 2017). Thus, the process of creating a DeP is framed as the “connective tissue” between the personal and the professional identities of TCs within their evolving professional learning communities.

In our eight years of practice in using DePs across courses, we have noted that they have helped to create a professional learning community approach for TCs in relation to learning digital literacy skills, reflecting on their forming teacher identity, and developing a DeP they owned and valued. In the rest of this paper we will focus on one particular course, “Information and Communication Technologies in Education” for generalist teachers who were in the second year of a four year Bachelor of Education program. Typically the course has thirty-five TCs, mostly female, in early to mid-twenties, often with limited digital technology skills. As part of the course, students as TCs create a DeP using a server called Folioz.ca powered by the open-source eP software Mahara. The course draws on several of James Gee’s (2003, 2007 and 2008) principles for good learning that are present in successful video games and are advocated by contemporary learning theories (Barab & Plucker, 2002; Illeris, 2009). In particular, the following of Gee’s principles for how players learn in video games emerged in the process of developing an understanding of common DeP construction processes:

1. Co-design and customization – Players feel like active agents (producers) rather than passive recipients (consumers); through engaged participation they select tools to use and develop the look of their character and/or worlds.

2. Identity formation – Role-playing video games enable deep learning that requires an extended commitment to new identities that players value and in which they become heavily invested. As Gee (2007) notes, “context of identity and activity -- learned as part and parcel of being a certain sort of person needing to do certain sorts of things for purposes and goals” (p. 32) are extremely important.

3. Manipulation and distributed knowing -- Human perception and action are deeply inter-connected with the objects in the world they can manipulate. Humans feel expanded and empowered when they can manipulate powerful tools in intricate ways that extend their area of effectiveness and connection to others.

4. Pleasantly frustrating – Tasks are pleasantly frustrating when at the outer edge of the learners’ comfort but within their “regimes of competence”.

5. Cycles of expertise -- Expertise is formed through repetition (with variation) only to be challenged again with new more demanding tasks and goals.

6. Information available “on demand” and “just in time” -- Video games almost always give verbal and text hints/information either “just in time”—that is, right when players need it and can use it—or “on demand”, that is, when the player feels a need for it, wants it, is ready for it, and can make good use of it.

7. Sandboxes -- Good video games lower the consequences of failure; players can start from the last saved game when they fail. Players are thereby encouraged to take risks, explore, and try new things. In fact, in a game, failure is a good thing.
8. System thinking -- Games encourage players to think about relationships, not isolated events, facts, and skills; their experience is “enhanced when we know how it fits into a larger meaningful whole” (Gee, 2007, p. 41-42).

9. Well-ordered problems -- In video games early problems are designed to lead players to make good guesses about how to proceed when they face more challenging problems later on in the game.

10. “Cross-functional affiliation” (Gee, 2007, p. 27) -- people are affiliated by their commitment to a common endeavour and learn skills to complete certain functions related to that commitment either within a team or to share with friends. Such skills are later available as resources for the whole group if and when they are needed.

In the next section we describe how these principles became evident as TCs constructed their DePs.

THE “ROADMAP” TO A DEP WITHIN A COURSE

Figure 1 presents a graphical “roadmap” representation of the phases that TCs experience when constructing their DeP. While this roadmap should be understood as fluid in nature as our understanding of the DeP construction processes are continually evolving, it has to date been a means of identifying the pedagogical ideas, reflexive practices, and digital literacy skills that these TCs were contemplating and acquiring as they moved from DeP inception to the use of DeP in practice. As can be seen in Figure 1, the inception of
TCs' DePs began with inputting their personal information and constructing a basic public profile. TCs then quickly moved to asking for assistance with customizing the look of their DeP with background colours, personal images, key quotes and personal commitments to becoming a teacher. Here TCs were actively constructing their identity, which coincided with two well-ordered problems: 1) how to make their DeP look professional but personal; and 2) the creation of a 90 second video related to entering the teaching profession entitled “Who am I?” This assignment had TCs using videos and images from their past that helped them to visually explicate why they wanted to be a teacher and the questions they wished to address throughout their program. It was expected that TCs would post their video on their new DeP profile for their peers to view and provide feedback. This video would simultaneously become their first “artifact” within their DeP and start them on the path to further personalize their DeP and develop a professional identity. Immediately, with in a community of peers creating videos, TCs quickly picked up the skills of creating a video and manipulating the digital tools such as iMovie, Movie-Maker or screen capture programs. They creatively shaped personal images and other artifacts from their pasts as they responded to the question “Who am I?”; some even made short animation videos to describe key anecdotes related to their experiences. TCs, keen to get to know each other, eagerly watched each other’s movies. As the instructor commented, “Before I had the chance to accept a video as completed I noted it had been viewed 52 times.” From previous years of developing the DeP, it became apparent that TCs would benefit from seeing a visual representation of the DeP construction processes (the roadmap, see Figure 1). The roadmap was subsequently created and made accessible to TCs by embedding it within a public Prezi, which allowed them to zoom-in and zoom-
out as they navigated the ePortfolio platform and reflected on artifacts. This visual created what Gee (2007) has referred to as system thinking in video game play, where gamers are able to see an overview of the worlds they are entering and the quests/tasks they will overcome to reach their ultimate goal. TCs’ ultimate goal here, as shown in the roadmap, was a successful exit interview conducted by a professional from the teaching field. It became apparent also that they would benefit from tutorial videos that concisely explicated the fundamentals of Folioz.ca. These videos, which were available within a Youtube playlist, became more meaningful when integrated in the roadmap. Figure 2 shows how videos became strategically accessible through the Prezi-based roadmap based on well-ordered tasks in the course. The rectangle bubbles in Figure 2 show the video that would play once the icon was clicked. These “how-to” technical videos were simultaneously created with the roadmap to explain various aspects of Folioz.ca with which TCs indicated difficulties. For example, videos were constructed on topics including: creating pages for DePs; resizing images for optimal Folioz.ca usage; embedding content from Google Apps; and giving feedback. The inclusion of videos on the roadmap effectively created information “on demand” and “just in time” for the TCs, allowing them to address required tasks with regards to their DeP construction. As shown in the roadmap, when TCs reached the second bend, more senior TCs from the previous year of the course did presentations in small groups on their completed ePs. This sharing offered further system thinking as it allowed the novice TCs to imagine more what they could do and what they wanted to do with their DeP.

By the end of the course, 34 technical videos were created in total and were accessible via Youtube and the Prezi-based roadmap. As shown in Figure 2, viewing DeP construction processes while also accessing related technical tutorials was interactive and informative, allowing TCs the opportunity to develop their DeP outside of class time at their own rate. TCs subsequently learned most digital skills as they were challenged to develop their DeP. The instructor hardly ever engaged in whole class instruction but would instead show an idea that was possible as a way of stimulating TCs’ imaginations.

Rather than encounter technical roadblocks while trying something, TCs would experiment, get stuck, and then refer to the roadmap, videos, or ask a peer. This became a “pleasantly frustrating” experience rather than an insurmountable barrier. The tutorial videos guided progress but also showed new ideas previously not imagined, such as linking to social networks with icon buttons, creating elaborate skins for background colours or allowing pages to be copied by peers. Often TCs also asked each other how to do technical tasks on the eP platform, or the instructor referred them to the appropriate video. Tasks in the course reflected a gradual increase in complexity both for digital skills, personal professional reflection and inter-connected knowing across courses and life experiences. In this way, cycles of expertise evolved as TCs repeated simpler digital skills. For example, learning to resize an image for a profile page led to learning how to maintain the dimension of a page while being mindful of resolution and the speed at which the page would load.

**Gamifying the Digital Literacy Skills**

To support the learning of digital literacy skills, a reward system using digital badges was created as a way of gamifying the learning in the Information Technologies course. Knapp (2012) defines gamification as “using game-based mechanics, aesthetics and game thinking to engage people, motivate action, promote learning, and solve problems” (p. 10). In this way, video game structures such as experience points were awarded for TCs completing tasks (Perron & Wolf, 2008) and TCs were placed in teams to collect points for completing digital literacy tasks. Within the course, TCs were expected to learn an array of digital literacy skills related to common digital tools used in schools such as blogging, Google apps, Youtube, video editors and digital skills related to developing their DeP using the Mahara software. These tools and skills, while useful in DeP creation, are multifaceted as the effective use of technology is central with regards to future employability (Van Staden, 2016).

Each digital badge represented micro-credential certificates for discreet skills like uploading a video to Youtube and embedding a blog within a Folioz page. These badges were assigned using the MOODLE learning management system. Prior to the course starting, TCs were divided into teams based on an on-line survey on their prior experiences with digital technology. Points were then collected for earning digital badges and other points were obtained for completing tasks like...
assignments and building team spirit. Each team’s point totals were displayed on a league table that was accessible to all TCs via MOODLE. Within this gamification system, the DeP software afforded the most opportunities for learning digital literacy skills and scoring points. At the end of the term, the team with the most points was awarded a homemade trophy on which their team name was ‘engraved’ – all in the spirit of friendly engagement. All the other teams won awards for an array of other course-related categories like ‘team spirit’ or ‘best use of technology’. This points system helped to create strong team affiliation, with teams creating a team name and assigning team roles related to course tasks such as team manager, team social coordinator, technology consultant and league official. TCs then felt encouraged to assist all other members of their team to earn digital badges as well as assist in passing on ideas about how to use the digital literacy tools. This points system and badges helped to create the strong cross-functional team affiliation idea advocated by Gee (2007, 2008).

The instructor gave digital badges when specific tasks were completed. In relation to the DeP, evidence was submitted such as screen captures or links to pages that showed what digital literacy skill(s) the TC had achieved and the subsequent badge or badges the TC thought they had earned. These badges were embedded within the Prezi-based roadmap as shown in Figure 3. Using the Mozilla backpack system, TCs simultaneously collected digital badges and embedded them into their DeP in clustered groupings. These badges then became artifacts of their digital literacy skills, which they reflected upon as TCs and prospective teachers in their DeP.

Figure 3: Roadmap of pedagogical approach with videos, digital badges and peer assessment
Digital badges were more explicitly earned by TCs as they constructed and tailored their DeP through activities such as inputting personal information, embedding content via external sources (i.e. Google Drive, Dropbox and Youtube), and sharing pages with others. TCs could also earn digital badges for demonstrating advanced skills and abilities related to the use of Google Drive, YouTube, Twitter feeds and external blogs within their DeP. As TCs learned to apply these more advanced digital literacy skills, they reflected on these skills as learners and then considered what they could do as future teachers, as shown in Figure 4. This page, while varying in colour and written content, was characterized by clustered groupings of related badges. Generating these clustered groupings allowed TCs to utilize their evolving knowledge of creating and personalizing pages within Folioz. Perhaps more importantly, however, this creative process also allowed TCs to reflect on the evolution of their digital literacy skills and how these skills were influencing their emerging professional identity as a teacher.

TCs continually revised their digital badge pages within Folioz throughout the semester as they earned new badges and honed their digital literacy skills. When they revisited these pages it was easy to quickly remind themselves of the meaning and digital literacy skills behind each badge earned. By clicking on a badge, a secondary page opened that provided a description of how the badge was earned and the corresponding Youtube tutorial about how to perform the related activity within Folioz.ca (see Figure 5). This digital badge context was a mechanism to recall skills as they progressed with more complex tasks. It allowed TCs to further reflect on their evolving digital literacy skills and consider how these skills impacted their emerging teaching identity.

As TCs continually reflected on their evolving digital literacy skills, the processes of DeP construction and their emerging teaching identity, they were also repeatedly reminded by the instructor to consider the potential audiences who might view their DeP. These reminders...
led to class-wide discussions about the importance of privacy when sharing content online and what types of information would be beneficial to share with individuals such as prospective employers and fellow TCs. Tutorial videos about privacy functions within Folioz.ca were created and TCs routinely tailored both collections and pages to specific audiences while limiting who could view specific content within their DeP. For example, pages with images of children learning skills in schools were collected with the permission of parents but then access was limited to only TCs in the class and other teachers.

CHECKPOINTS AND PEER ASSESSMENT

TCs were given three checkpoints throughout the course that reflected the bends on the roadmap. At the first checkpoint, the TCs created a profile page, a digital badges page and one artifact page. During this time, a peer was assigned to give initial feedback. This process of review mimicked Gee’s (2003) idea of Sandboxes, where TCs were able to try things, get feedback from their peers (and instructor), and then revise as needed. This process also reinforced the idea that pages were fluid and updatable. Feedback was for improving and refining pages and associated reflection, not for judging or rating. TCs learned they could experiment and add to their pages as they developed their thinking, received feedback or noted something on a peer’s page. The pages that TCs created at the first checkpoint contained one or a few preliminary artifacts that represented their emerging teaching identity. All artifacts selected were a matter of personal choice; suggestions were offered by the instructor, but ultimately it was up to the TCs to decide what they valued that related to them becoming a teacher and that they wanted to reflect upon. In this way, TCs continuously designed and customized their DePs, as shown in Figure 6, at each
checkpoint. They used personal content and aesthetics to develop a sense of teacher identity. Criteria for guiding feedback on DePs were co-created by the second checkpoint as TCs made suggestions as to what made an effective DeP entry based on a common commitment to developing as a teacher.

TCs collected an array of rich media artifacts from their experiences related to becoming a teacher; as they developed series of pages they then combined these pages into collections. These artifacts were analyzed by TCs in relation to their beliefs about teaching and learning and the provincial competencies for being certified as a teacher. To guide TCs’ reflective writing, a STARR (situation, task, action, result, reflection) model was used, which centred on the following questions:

- **S** What is the situation (context) of the artifacts on this page?
- **T** What were the task(s) done by you in a teacher or TC role?
- **A** What actions took place by those involved? How does the evidence on the page connect to these actions?
- **R** What was the response of the TCs/people involved?
- **R** Reflecting on the artifact, what have you learned from this experience?

These questions helped the TC consider the type of details that would enable any person reading their DeP to understand how the artifacts contributed to their forming knowledge of becoming a teacher. Implicit in their writing...
was why the artifact was selected and how it had helped them learn an aspect of what helps them be an effective teacher. Once a page was created with artifacts arranged and designed in a professional and aesthetic manner to the satisfaction of the TC, the page was then submitted for feedback from a peer. After this exchange, pages were revised and then submitted to the instructor to pass or give feedback to revise in order to pass.

By the second checkpoint, TCs were able to customize their pages, integrate feedback from their peers and instructor, and they had begun to organize their content using collections that represented pages connected by a common topic or theme. These collections, like each page, were fluid and updatable. The use of collections also coincided with Gee’s (2007) discussion of “manipulation and distributed knowing” concerning the TC’s forming sense of becoming a teacher. Creating pages with artifacts that then built into collections encouraged TCs to manipulate their experiences, using digital literacy skills, from an array of distributed experiences. This allowed an emerging sense of teaching identity to form as inter-connected knowing as a whole, rather than contemplating single events or isolated skills. The construction of collections required TCs to consider how ideas, concepts, and events were related as they continued to refine their DeP content in preparation for their course exit interview.

The third checkpoint for TCs within the course was marked by preparation for an exit interview that occurred in the final week of the semester. After checkpoint two, TCs continued to build their DeP using assignments from an array of courses throughout the term and sharing their work with their peers, instructor and, where appropriate, with the public. Public pages or collections could also be shared via social media and TCs were thrilled when other colleagues acknowledged or re-tweeted their resources. To pass the course, TCs had to have at least ten artifacts as evidence of their learning to become a teacher from across life-experiences and courses in the program. Most TCs had many more.

The interview was a semi-formal conversation between one TC and a professional educator such as a university instructor, program manager, schoolteacher, district principal or school principal. Prior to the exit interviews, the bios of the interviewers were circulated to the TCs, allowing them to imagine being interviewed by an experienced person from the field. This added an air of authenticity to the interview where the stakes were high, in order to show themselves in the best possible light in preparation for a future interview for a teaching position. During this conversational style interview: the TCs were asked to demonstrate the digital literacy skills they acquired and honed through the creation of their DeP; reflect on their forming professional identity; and to comment on important artifacts to them, noting why they were of importance. By this point in the course, TCs were truly reflecting on who they wished to be as teachers. They had learnt to recognize their own deep learning, required as a result of an extended commitment to thinking like a teacher in constructing their DeP. The conversations during these interviews provided space for reflection and commentary on the realities of teaching. These interviews were recorded as screen captured videos and became artifacts for TCs to reflect upon as their final task to show completion of their course requirements. In a previous case study on the use of exit interviews with DePs, we captured the sentiment below from a TC:

EXTREMELY rewarding. I feel that the process of synthesizing who I am as a teacher was so beneficial...The ePortfolio allowed me to reflect on my experiences and beliefs and how they will directly apply to the classroom. Before this experience, I thought of my experiences as separate from each other, but it was cool to see how all of them shape who I will become as a teacher (p. 29, Hopper, et al., 2016).

Creating conditions for reflective learning practices to emerge

The roadmap represents the evolution of an emerging pedagogical practice in a teacher education course that focused on creating processes, using digital technologies systems that linked TCs’ learning across courses and in relation to life experiences they valued in becoming a teacher. As we have noted previously, and drawing on Hoban (2006), these processes created the “connective tissue” between experiences related to a TC becoming a teacher (Hopper et al., 2017). The DePs, within the team based, gamified course, structured around Gee’s (2007) video game learning principles, created the conditions for cross-course, cross-program and cross-life professional learning for TCs where they took on the complex challenge of becoming a teacher whilst learning digital literacy skills. Table 1 summarizes the key features
### Table 1: Key features of selected principles of design in James Gee’s analysis of successful video games

<table>
<thead>
<tr>
<th>James Gee Principles</th>
<th>Key idea in principle</th>
<th>Summary in Course</th>
</tr>
</thead>
<tbody>
<tr>
<td>Co-design and customization</td>
<td>Engaged participation as students select tools to use and develop Digital ePortfolio.</td>
<td>Very personal with a range digital tools available for TCs to utilize, as well as layout, color and page skins.</td>
</tr>
<tr>
<td>Identity formation</td>
<td>Commitment to forming teacher identity in which students become heavily invested.</td>
<td>Confidence developed in forming teaching identity as share evidence over time that is assessed by peers and educators.</td>
</tr>
<tr>
<td>Manipulation and distributed knowing</td>
<td>Students learning inter-connected with the objects in the world they can manipulate.</td>
<td>Artifacts on pages and pages in collection fluid, updateable and developed with feedback as associations realized.</td>
</tr>
<tr>
<td>Pleasantly frustrating</td>
<td>Tasks at the outer edge of the learners’ comfort.</td>
<td>Roadmap and embedded videos, with digital badges created support as challenges emerged.</td>
</tr>
<tr>
<td>Cycles of expertise</td>
<td>Expertise is formed through repetition with new more demanding tasks and goals.</td>
<td>Tasks in the course reflected a gradual increase in complexity and skills were repeated as part of more complex tasks.</td>
</tr>
<tr>
<td>Information available “on demand” and “just in time”</td>
<td>Information when student feels a need for it, wants it, is ready for it, and can make good use of it.</td>
<td>Independent learning process supported by short videos on digital tasks, with minimal if any direct instruction from instructor.</td>
</tr>
<tr>
<td>Sandboxes</td>
<td>Low risk for trying something encourages students to take risks, explore and try new things.</td>
<td>TCs were able to try things, get feedback from their peers (and instructor), and then revise as needed.</td>
</tr>
<tr>
<td>System thinking</td>
<td>Students think about relationships in tasks. Experience is enhanced when students know how it fits into a larger meaningful whole.</td>
<td>Interactive roadmap offered the TC teachers an overview of the course so that they could locate their actions both reflective and digital skills.</td>
</tr>
<tr>
<td>Well-ordered problems</td>
<td>Problems are designed to lead players to make good guesses about how to proceed when they face more challenging problems.</td>
<td>Problems sequenced to build digital skills. As teachers learning to reflect on and give professional feedback to peers as build to exit interview.</td>
</tr>
<tr>
<td>“Cross-functional affiliation”</td>
<td>Students are affiliated by their commitment to a common endeavour and learn skills to complete certain functions in a team.</td>
<td>This points system and badges helped to create a strong cross-functional team affiliation with assigning of team roles to related course tasks.</td>
</tr>
</tbody>
</table>

Typically, when TCs first tried to reflect on their selected artifacts; they found it hard to unpack the learning within the experience; they sometimes struggled to imagine a potential audience and what that audience needs to know in order to understand the TCs’ lived experience. In addition, TCs had been programmed to only do work for a grade, as is common in higher education (Egan, 2016; Light, 2016; Van Staden, 2016).
As the educational technology course was credit/non-credit they initially only gave the reflection a cursory glance. However, the constant opportunities to see each other’s work, the encouragement from peers to earn badges to score team points, the STARR framework to help unpack and present the artifacts and the ability to see links across learning experiences all created a sense of professional awareness forming in their program experiences and a sense of pride and accomplishment.

In debriefing conversations after the DeP exit interviews, students repeatedly reported being surprised at how much they had learned and feeling confident about becoming a teacher (see CSSE video). By the time the TCs completed the exit interview, this sense of pride fully emerged in the exit interview as what seemingly scattered learning across courses and life experiences suddenly came together to contribute to a teacher identity, an interconnected whole that was acknowledged by all the interviewers. This whole was more than the sum of the parts. The interaction between the parts created constant sources of surprise and revelation as TCs embraced how much they had learned and how much they knew already before being a teacher in a school. Throughout the process of DeP creation TCs were also enabled to select quality work and to stimulate quality reflections without resorting to competitive grading comparisons. Avoiding such comparisons is imperative as recent reviews note how traditional numeric grades fail to promote deep, reflective, conceptual, and non-traditional forms of learning (Light, 2016; Van Staden, 2016).

The DeP offered a networking system that allowed TCs to recall experiences from across different contexts that clustered around their desire to be a worthwhile and effective teacher. This recall space and their re-representation of past experiences also allowed TCs to share with peers a common intent to teach well, to teach with conviction and to teach to make a difference. Artifacts about relatives and teachers that had inspired them to become a teacher often represented these commitments. In addition, the digital badges, mapping the array of digital literacy skills needed to create the DeP and engage in course assignments, became a powerful memory tool of discrete skills. The whole independent learning process supported by videos “just in time” and “as needed”, with minimal if any direct instruction from the instructor, gave students confidence in their ability to use and manipulate digital technologies. Finally, the digital badges page and the DeP itself offered concrete evidence of the TCs’ ability to use digital literacy skills as future teachers in increasingly technology-rich classrooms.

Assessment in the DeP focused on helping TCs recognize their own learning in the service of becoming a teacher, “the patterns that connect” as noted by Bateson (1979, p. 16), so that they could call upon this skill or knowledge and develop its application in order to advance the pursuit of becoming a teacher. Digital electronic portfolios provide space for reflection to be integrally embedded into all of the TCs’ learning experiences. As with video game structures, reflection translates immediately to action, hence becoming reflexivity -- reflection in action -- rather than reflection for its own sake. The reflexive process described in this paper became a natural and ongoing aspect of all of the TCs’ learning, without which their learning could have become superficial and fragmented. Reflexive practice enables learners to engage fully in their own learning and to create communities of reflexive practitioners. The aspects of learning described in this paper (i.e., digital badges, DeP creation, and self-directed learning) all lead to the embedded and ongoing sense of reflection that we feel will translate to action. Key for the DeP process is enabling TCs to value their learning, take ownership of their learning, and share their learning with diverse and significant audiences.
Nicola Walker, an Instructor within the Department of Social Work and a Researcher within the Faculty of Education at the University of Victoria, has been exploring the pedagogical value of ePortfolios within post-secondary education since completing her graduate work in 2015. She is currently part of an interdisciplinary research team examining the use of ePortfolios within professional training programs for teachers, social workers, and nurses.

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Hong Fu (Victoria, Canada), postdoc researcher within the Faculty of Education, University of Victoria, has been part of the research team for ePortfolio development in three professional programs since 2014.

Kathy Sanford, Professor in the Department of Curriculum & Instruction, Faculty of Education at the University of Victoria, has been researching the pedagogical values of digital ePortfolios for over 15 years. She is committed to ePortfolios as a space where learners in 21st century professional programs can take responsibility for their learning, develop their professional identity, see learning as a life-long process, and share their learning with others.

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A roadmap to digital ePortfolio proficiency

Nicola Walker, Tim Hopper, Hong Fu and Kathy Sanford


Call for proposals

The Association for Authentic, Experiential and Evidence-Based Learning (AAEEBL) ePortfolio Review invites you to submit a proposal for an article or report covering the broad area of eportfolio use including: pedagogy (or learning theory, as you prefer), research (AePR is not a double-blind peer-reviewed research journal but articles about research are welcome), technical (including articles about technology), and/or organizational issues. Published tri-annually (November, March and July), for eportfolio practitioners, administrators, and students, The AAEEBL ePortfolio Review is an online journal serving the needs of the global eportfolio community and seeks to promote portfolio learning as a major way to transform higher education.

**Issue Theme - Assessment Practices**

Assessment. It is at the heart of education. There are very few, if any, other ways we can truly know how effective we are. Assessment methods take many forms, and assessment programs take many shapes; however, the goal of any assessment is to evaluate the success to which something has occurred. Within education, we typically think of assessment in terms of judging how well our students are learning. Traditionally, assessments were tests, paper, quizzes and other assignments in which the instructor evaluated the students in a very one dimensional dynamic, but the development of eportfolios have allowed a secondary dimension to enter the assessment framework, that of the perspective of the learner or program being assessed. The use of ePortfolios allows the learner to demonstrate not only what they learn but also how they have applied that in areas of their lives. Assessment portfolios allow users to demonstrate the skills and competencies they have gained throughout the learning process, whether that is a single course or an entire program/degree.

The fourth issue of AePR is interested in uncovering your best assessment practices. In this issue, we welcome articles highlighting both successful and unsuccessful assessment programs and the lessons learned from each. We are also interested in articles that highlight eportfolio assessment practices outside the traditional classroom: accreditation self-studies, promotion and tenure reviews, scholarship applications, and the like.

**Important Dates**

- Submission Deadline: June 5, 2017
- Notification of Acceptance: June 19, 2017
- Draft Article Due: July 25, 2017
- Publication: Oct/Nov 2017

For complete details, go to [www.theaepr.org](http://www.theaepr.org)
AAEEBL annual conference

AAEEBL’s Annual Conference will be held on a university campus for the first time. The schedule will be the same as it has been each year. Costs will be significantly less, both for attendees and for exhibitors. The Conference page link is below.

When: July 24 - 27, 2017
Time: 8:30 AM
Where: Portland State University, University Place Hotel and Conference Center
Portland, Oregon
United States

For complete details, go to www.aaeebl.org