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Association of American Colleges and Universities (AAC&U)
Australian Flexible Learning Framework
2012 ePortfolio and Identity Conference

Manuscript Review Board

The Annual AAEEBL Survey at Two: Looking Back and Looking Ahead

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This report on the second year of the annual Association for Authentic, Experiential, & Evidenced-Based Learning (AAEEBL) survey provides insights into the landscape of ePortfolio adoption and use within academic settings in the United States and abroad from the perspective of a self-selected sample of the organization's members. This report identifies the demographics of ePortfolio practitioners and explores the relationships among teaching beliefs, ePortfolio practices, and specific ePortfolio technologies. Drawing from data from the 2011 and 2012 administrations, emerging trends and preliminary findings begin to inform topics and sub-groups for future investigation, particularly with respect to the impact of ePortfolio pedagogy, technology, and culture on teaching beliefs operationalized as teacher, learner, and learning-centered orientations. The outcomes of this work have implications for the design of future deployments of the AAEEBL survey, but also for more targeted studies of ePortfolio implementations in specific disciplines and demographic groups.

The mission of the Association for Authentic Experiential Evidence-Based Learning (AAEEBL) is to leverage ePortfolios to change teaching practices in ways that might afford students more genuine and durable learning experiences. Accordingly, when we launched the annual survey two years ago, we did not aspire only to track the spread of ePortfolios. We hoped to understand the characteristics and nuances of transformation associated with portfolio practice.

In designing the AAEEBL membership survey, we purposely aimed to differentiate this instrument from other data collection efforts related to ePortfolios. For example, since 2003, the Campus Computing Project's annual survey of senior campus IT officers has tracked the increase in ePortfolio services across all sectors of higher education including two- and four-year public and private colleges and universities across the United States (Campus Computing Project, 2012). Representing the student perspective, the Educause Center for Applied Research (ECAR) conducts an annual Study of Undergraduate Students and Information Technology and found a similar and substantial growth in the use of ePortfolios reported by students (nearly sevenfold, from 7% to 52%) from 2010-2012 (Dahlstrom, 2012).

In contrast, the AAEEBL survey specifically addresses issues of interest to its diverse global membership which includes educators, practitioners, and ePortfolio technology vendors. As individuals representing institutions and organizations who have a pedagogical, technological, and/or financial investment in ePortfolios, AAEEBL members share a common interest in using ePortfolios to support learners and transform institutional cultures. The current survey instrument focuses on exploring the relationships among teaching beliefs, ePortfolio practices, and specific ePortfolio technologies. Because of AAEEBL's corporate affiliate program and partnerships with leading ePortfolio providers, the findings from the annual membership survey are uniquely positioned to directly inform decisions made by these providers as to what kinds of ePortfolio features are valuable, useful, and needed by subsets of groups representing various demographic characteristics. As a result, we expect the AAEEBL membership survey instrument to evolve from year to year so that it may stay current and responsive to the relevant needs, challenges, and issues of the global ePortfolio community.

The 2012 AAEEBL annual survey is now past two independent pilots (Brown, Cho, & Ater-Kranov, 2012) and one year since modifications and implementation through AAEEBL. The results from the second year of the AAEEBL survey suggest that the implementation of ePortfolios, as compared with the pilot efforts and the inaugural AAEEBL administration, does indeed reflect an evolution in practice and teaching beliefs. The use of ePortfolios is gaining ground, and there is evidence that they are changing the ways practitioners think about teaching and learning. One key aspect of teaching practice in particular—how ePortfolio practitioners approach evaluation—has changed in ways that have significant and interesting implications.

This update on emerging findings from the AAEEBL survey will present first an overview of the demographic changes and spread of ePortfolio practice. We will then report on the development of the constructs of teaching beliefs as compared with previous pilots as well as the evolution of the ways we have assessed them. Finally, we will describe the distribution of those beliefs in practice and how those beliefs are now shaping and reflecting new teaching practices.

Surveying ePortfolio Demographics

The first part of the AAEEBL ePortfolio survey focused on the demographics of ePortfolio practitioners

and ePortfolio initiatives emerging around the world: Who are ePortfolio practitioners? What are the sizes of the institutions they represent, what programs/disciplines, and what platforms or ePortfolio tools do they use? What is the primary purpose of the initiative? This baseline demographic information is important, but it is also subordinate to the second part of the survey which was designed to help understand some of the underlying thinking that might ultimately help AAEEBL and ePortfolio practitioners support each other in advancing practices that promote useful and durable learning. Survey participants were asked to respond to the survey questions from their own individual, personal and professional vantage, focusing on a single ePortfolio project or program in which they were involved. The survey took approximately 15 minutes to complete.

Participant Recruitment

The AAEEBL survey was first administered in Spring 2011 and again in Spring 2012. In both years, the distribution of the survey was by call in an email invitation to AAEEBL members and colleagues working with ePortfolios on AAEEBL campuses. In addition, sister organizations were also asked to distribute the survey by email through their listservs.

Survey participation was solicited through partner organizations including the WICHE Cooperative for Educational Technologies (WCET), EDUCAUSE Learning Initiative (ELI), ePortfolio Action and Communication (EPAC) Community of Practice, ePortfolio Australia, and others.

Response Distribution by Country

In 2012, of the 243 responses from 13 countries representing 97 institutions, approximately 80% of responses were from the United States. There were 20 responses from the United Kingdom, nine responses from Canada, eight responses from Australia, two responses each from Switzerland and Germany, and one response each from Argentina, Austria, Netherlands, New Zealand, Spain, Sri Lanka, Tunisia. Figures 1 and 2 represent the geographic distribution of responses in the 2011 to 2012 administrations of the AAEEBL membership survey. It is not clear, of course, the extent to which this distribution is representative of global penetration of ePortfolio use. We make no claims that the response distribution reflects anything beyond the views of the professionals who elected to respond to the survey.

Figure 1
Geographic Distribution of Responses from 2011 AAEEBL Membership Survey

Note. Yellow balloons indicate one response in that country. *N* = 176.

Figure 2
Geographic Distribution of Responses from 2012 AAEEBL Membership Survey
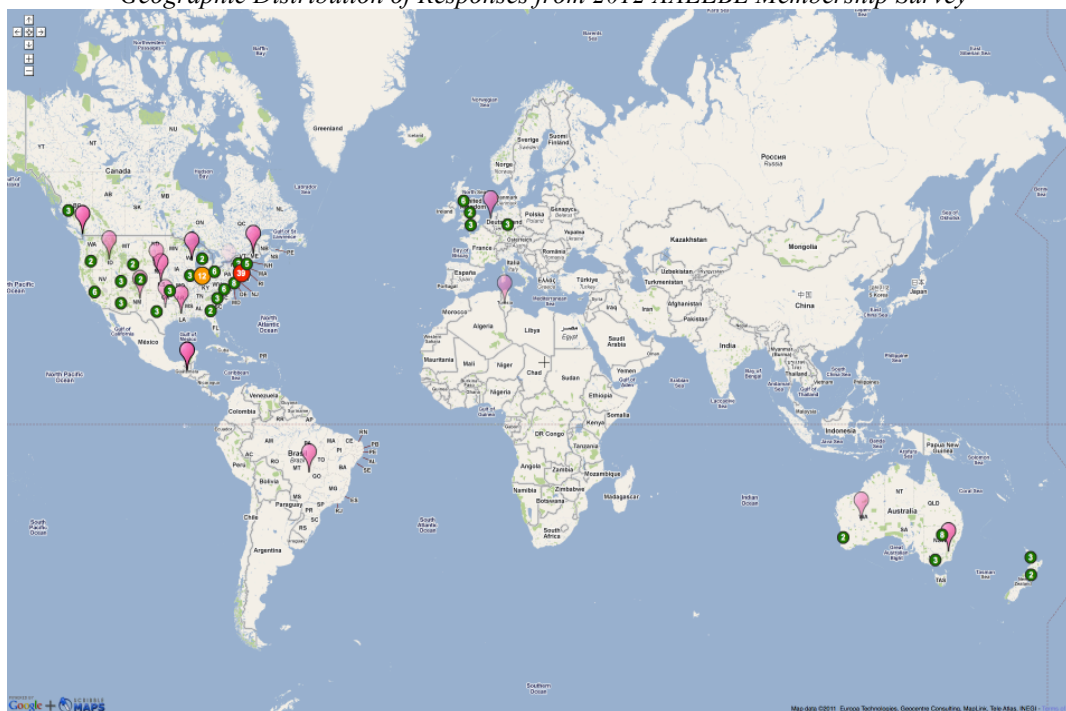
Note. Purple balloons indicate one response in that country. *N* = 243.

What are the Characteristics of ePortfolio Practitioners?

Institutional size and enrollments are relatively constant when we compare responses between 2011 and 2012. Institutional types remain consistent from both 2011 and 2012, with fewer than 4% representing for-profit institutions and roughly 10% representing ePortfolio users reporting from community colleges. The variation is also consistent with findings from the Campus Computing Project (2011) that showed limited survey responses from community colleges. It also suggests that greater representation from these institutions would certainly provide additional insights into ePortfolio practices for a broader and more diverse student population within higher education.

Disciplinary implementation appears to be relatively stable from 2011 to 2012. As in 2011, Teacher Education and Health Sciences are strongly represented. English also continues to be well represented along with Nursing and the Arts.

On a somewhat less promising note is the continued limited representation from Student Affairs practitioners in the results reported. This has implications not only for subject recruitment for future surveys but also for determining the relevance and generalizability of our findings to the curriculum, activities, and informal learning that take place outside of the classroom.

In both surveys, almost half of the respondents were full time professionals. Tenure track faculty in both surveys represent almost one-third of the respondents. There is only a modest 1% increase in respondents in 2012 who are assessment specialists, which is somewhat counter to our observations that assessment is becoming more collaborative. Though AAEEBL leaders have anticipated an increase in the use of ePortfolios for institutional assessment purposes, that trend, as Batson (2011) confirmed in interviews with ePortfolio vendors, does not appear to be visible in ways we might have envisioned. It may be, instead, that assessment in the ePortfolio community is being reintegrated with teaching practices. There is evidence elsewhere, notably in the emergence of Massive Open Online Courses (MOOCs), that assessment is being split off and outsourced as an aspect of education that is distinct from teaching and learning (e.g., Kolowich, 2012). This is not consistent with the picture of ePortfolio practice discerned from the AAEEBL survey where assessment appears to be integral to ePortfolio practice.

A key story that is beginning to emerge from 2011 to 2012 is the consistency in the professional roles represented by the respondents. Though the response rate increased by nearly a third, there is remarkably little change from the previous year in the key characteristics of respondents. The relative reliability from 2011 to 2012 suggests that there is an emerging

culture of ePortfolio practitioners that transcends institutional type and participant roles.

Where are ePortfolios Being Created and Adopted Within Institutions?

What is most pronounced in 2012 is that more students are producing ePortfolios. In 2011, 15% of respondents reported that 90-100% of students at their institutions had ePortfolios. In 2012, about 28% of respondents reported that 90-100% of their students are building ePortfolios. There also appears to be a gradual movement away from ePortfolios focused on courses toward those that are program-based (see Table 1). What predicates this change is not certain, but when students are expected to maintain ePortfolios for multiple courses, the locus of incentive evolves beyond the individual course, and that evolution appears to correspond, as we will discuss, with practices that are more collaborative as well as with teaching beliefs that are more learner or learning centered.

Who is Responsible for Evaluating Student ePortfolios?

In 2011, more than half of ePortfolio evaluation was conducted by the instructor or Teaching Assistant (54.4%). In 2012, that percentage is down by 16% and program level evaluation has increased by 5.1%. Cross disciplinary evaluation has increased by 4.2% and evaluation teams that include students are up by 6.2%. In sum, collaborative assessment has increased by a relative 15.5% (see Table 2). The growth of that collaboration is underscored by the increase in participation from the community represented by stakeholders beyond the institution. The involvement of external stakeholders reflects a small but critical change in institutional culture that is perhaps not surprisingly associated with evaluation practices at a time when accountability has gained increased national attention. This change of practice, as we will discuss, may not be trivial.

How has the Market for ePortfolio Technologies Evolved to Support Changing Institutional Needs?

In 2012, we continued to ask respondents about the ePortfolio platforms they used. The findings in 2012 as compared with 2011 reveal a market that is in flux (Batson, 2012). The use of homegrown applications appears to be decreasing which is consistent with corresponding findings elsewhere indicating that costs and security are driving institutions to new vendor partnerships. We note the parallel with evaluation practices that suggest that the walls of higher education are coming down. The market also appears to be

expanding with more commercial applications represented in the response pool. Though the dissemination of ePortfolios appears to be a rising tide, it is too soon to tell how the market will shake out. While it would be imprudent to share preliminary findings and speculations, the trends suggest that this growth may well continue for some time.

What is the Relationship Between Professional Development via AAEEBL and the Changing ePortfolio Culture?

Underscoring the emerging picture of ePortfolio users as members of an ascending and distinct culture of educational practice is the counter-intuitive change in respondents to the AAEEBL annual survey. Table 3 shows that there was an almost 18% increase in the number of respondents who did not know if they or their institution was a member of AAEEBL. There was another 15% decrease in respondents who identified themselves as members of AAEEBL. What this suggests is that educators who received the invitation and responded to the survey represent a reliable group of educators engaged in a notable and emerging sub-culture of educational practice. It is the practice of teaching with ePortfolios that binds them.

Teaching Beliefs—Monitoring the Penetration of ePortfolios Beyond Demographics

As noted, a key research goal of the AAEEBL annual survey has been to document the transformative impact of ePortfolio practices. Those practices, in turn, are inextricably entwined with the teaching beliefs of ePortfolio practitioners. The relationship between one's beliefs and practices is complex (Fosnot, 1996; Trigwell & Prosser, 2004; van der Schaaf, Stokking, & Verloop, 2008), but our work itself rests upon the belief that over time we might leverage our understanding to help build a deeper educational community and capacity, enrich students' learning experiences, and do more to help students' take ever greater responsibility for their own learning.

The pilots conducted by Brown et al. (2012) together with the research and thinking of many (i.e., Brookfield, 1995; Downes, 2006; Kane, Sandretto, & Heath, 2002; Lave & Wenger, 1991; Siemens, 2004), informed and shaped the direction of the AAEEBL survey and the exploration of a fundamentally different set of assumptions and approaches to teaching and learning afforded by ePortfolios. From this work, we constructed, explored, and confirmed the relationships of three categories of teaching beliefs—teaching, learner, and learning-centered. For the purposes of orienting readers to this report, we provide these brief descriptions:

Table 1
Frequency Distribution of Contexts for ePortfolio Adoption from the 2012 AAEEBL Membership Survey

ePortfolio Context	2011		2012	
	Frequency	Percent	Frequency	Percent
Individual course	51	32.9%	51	25.8%
Program or department in Academic Affairs	41	26.5%	75	37.9%
Program or unit in Student Affairs	7	4.5%	9	4.5%
Institution-wide	38	24.5%	39	19.6%
Other	18	11.6%	24	12.1%
Total	155	100.0%	198	100.0%

Table 2
Frequency Distribution of Evaluators of Student ePortfolios from the 2012 AAEEBL Membership Survey

Student ePortfolio Evaluator	2011		2012	
	Frequency	Percent	Frequency	Percent
The instructor (or designated assistant)	67	54.4%	75	38.9%
Faculty and members of the academic program	37	30.1%	68	35.2%
Cross-disciplinary teams both inside and outside of the institution	12	9.8%	27	14.0%
Teams of faculty and stakeholders, including student peers	7	5.7%	23	11.9%
Total	123	100.0%	193	100.0%

Table 3
Frequency Distribution of Awareness of AAEEBL Membership Status from the 2012 AAEEBL Membership Survey

AAEEBL Membership Status	2011		2012	
	Frequency	Percent	Frequency	Percent
AAEEBL Members	63	37.5%	54	21.9%
Not AAEEBL Members	45	26.8%	61	24.7%
Not Known	60	35.7%	132	53.4%
Total	168	100.0%	247	100.0%

- *Teaching-centered* beliefs are represented in practice when it is predominantly the faculty member who determines not only what is to be learned and how that learning is to be measured. Teacher-centered practices are also guided by structures and sequences of activities that are determined and controlled by the instructor.
- *Learner-centered* beliefs are represented in practice when it is still the faculty member who determines what is to be learned but unlike teacher-centered beliefs, learner-centered practices encourage incipient student agency by engaging students more fully in the process of determining answers or solutions as well as modes and avenues for presentation. Learner-centered practices often situate learning in ill-structured domains that often do not have clear correct answers.

- *Learning-centered* practices are represented in practice when the faculty member invites learners to have some determination in not only how the work will be pursued and represented, but also in determining what it is that is necessary to learn. In learning-centered practice it is presumed that students will collaborate, employ peer review, and network to inform their learning.

We recognize that these belief constructs are not mutually exclusive. We know from our own work and the work of others that teachers' practices are shaped and reshaped by context and constraints. In various contexts, one set of beliefs and practices may have an instructional advantage as compared with others. Though we do not deny a bias for learner and learning-centered practice, it is precisely because we hold that

bias that the evolution of ePortfolio practice and the context it makes possible are interesting and promising.

Exploring the Constructs

To refine our understanding of ePortfolio practice, we developed these three constructs from the literature referenced earlier in this report. Using the data from the 2011 AAEEBL survey, we ran exploratory factor analyses. The factor analyses were used to explore and then confirm the viability of teaching belief constructs to help us understand more fully the implications of ePortfolio practice. For instance, we suspected that traditional teacher-centered beliefs would likely associate with ePortfolio contexts and practices that contrast from the beliefs of those working in collaborative and more expansive or institutional contexts. We wanted to ascertain in particular if the teaching belief constructs we derived and hypothesized were valid, and we wanted to refine the sub-scales of the survey instrument. The outcome of the exploratory factor analysis that was conducted is provided in Table 4, which presents the individual items and loadings by construct. Consistent with principles of factor analyses (Comrey & Lee, 1992), variables with factor pattern loadings less than 0.35 were excluded from the study. Variables that loaded on more than one factor were also excluded from the study. Table 5 lists the items that were retained for each teaching belief construct for the AAEEBL 2012 member survey.

Confirming the Teaching Belief Constructs

The exploratory factor analysis applied to data from the AAEEBL 2011 survey resulted in a reduced set of items for each of the three teaching belief constructs. The final model derived from the 2011 data set contained 13 valid items that indeed loaded on the three factors of teacher, learner, and learning centered beliefs (Table 5). We found that not all sections were equally balanced. For instance, we needed to develop two additional items to fit exclusively in the teacher-centered construct:

1. I design my teaching with the assumption that most of the students have little knowledge of the topics to be covered.
2. I feel it is important to present a lot of facts to students so that they know that they have to learn for this subject.

The 2012 AAEEBL survey provided the opportunity to confirm these constructs and the validity of these scales.

Once the underlying structure was developed (and hypothesized) from the exploratory factor analysis, we used a structural equation modeling confirmatory factor analysis to confirm the findings from the 2011 AAEEBL Data Set and to examine the relationship between the underlying constructs. The structure created was analyzed using the responses from the AAEEBL 2012 survey. The analyses included a Chi-Square Fit Index (i.e., likelihood ratio), Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA), and the Standardized Root Mean Square Residual (SRMR) in order to determine the acceptability of the model. The initial three-factor model provided the overall chi-square (χ^2) = 216.374, degrees of freedom (df) = 87, and p less than .000, CFI = .712, TLI = .664, RMSEA = 0.092, and SRMR = .099.

These fit indices suggested that this three-factor model needed to be modified. Most of the questions were a good fit. However, and as an example of the process, the question, "I assess students' teamwork skills" needed to be removed because it loaded on all three factors. In short, teamwork is not exclusively a teaching practice unique to a single teaching epistemology. The nuances of implementation of teamwork will, upon review and analysis, align with any number of objectives and any flavor of teaching belief. With refinements, we developed an analytical framework that attained significance for all factor loadings at the p = .05 level. In the analysis, we affirmed that beliefs can be validly referenced in three categories. The new questions provided useful distinctions.

Relationship Between Teaching Beliefs and ePortfolio Practice

Using the 2012 AAEEBL dataset, we examined the relationship between teaching beliefs and ePortfolio practice. A one-way multivariate analysis of variance (MANOVA) was conducted to identify patterns of teaching beliefs associated with ePortfolio practice. The Box's Test was not significant, thereby indicating that homogeneity of variance-covariance was fulfilled, F (18, 22199.788) = 1.100, p = .344, and Wilks' Lambda test statistic was used to interpret the MANOVA results. The MANOVA results revealed significant differences among different ePortfolio evaluation processes, Wilks' Λ = .891, F (9, 382.247) = 2.070, p = .031 < .05, η^2 = .038. An Analysis of variance (ANOVA) was conducted on each dependent variable as a follow-up test to the MANOVA. Univariate ANOVA results were interpreted using a more conservative alpha level (α = .05/3 = .017). These results revealed that the ePortfolio evaluation processes were significant for learning-centered beliefs (LEARNING), F (3, 159) = 3.603, p = .015 < α =.017, partial η^2= .064.

Table 4
Summary of Exploratory Factor Analysis Results for the Three Teaching Belief Measures (N = 69)

Item	Factor Loadings		
	Factor 1 (Teacher-Centered)	Factor 2 (Learner-Centered)	Factor 3 (Learning-Centered)
I use a textbook to plan my course.*	**.635**	-.051	-.039
Lectures are important models of subject matter expertise.*	**.813**	-.082	.079
Teachers should know the answers to questions that students ask.*	.288	.113	-.033
I focus primarily on information students will need to pass the exams.*	**.560**	-.113	-.082
The assessments I use have clear and correct answers.*	.124	.181	.024
My course activities usually require students to work individually.*	.332	.133	**-.636**
It is important to present basic knowledge to students.^	.029	.073	.016
I use thematic units to organize my teaching.^	.238	.056	-.051
It is important to collaborate with students in planning the course.^	-.065	.114	.016
I provide opportunities for students to discuss concepts that are new to them.^	-.032	.098	.027
When evaluating student performance, it is important to consider multiple examples of student work.^	-.078	**.348**	.190
Instruction should be flexible to accommodate students' individual needs.^	-.343	**.627**	.016
I am certain that I am making a difference in the lives of my students.^	.234	**.396**	-.092
Effective teachers consider students' prior knowledge or experience.^	.052	.030	.073
I encourage students to constantly check their own understanding while they are studying.^	-.111	**.660**	.162
I am good at helping all the students in my classes make significant improvement.^	.031	**.726**	-.083
I feel confident about my teaching skills.^	-.048	.265	.038
I encourage students to work together to solve authentic problems that students help identify.†	-.014	-.138	**.733**
It is important to help students reflect upon their thinking and learning processes.†	.111	-.015	.152
I provide opportunities for my students to critique each others' work.†	-.226	-.240	**.439**
Many of my assignments require students to work in groups to arrive at correct answers and solutions.†	.237	.244	**.738**
I value students' self assessment.†	.072	-.049	.037
I grade students' teamwork skills.†	.077	.284	**.659**
Eigenvalues	2.22	2.33	3.36
% of Variance	9.68	10.15	14.62

Note. Factor loadings greater than │ .35 │ are in bold.
* Item originally associated with Teaching-Centered Beliefs
^ Item originally associated with Learner-Centered Beliefs
†Item originally associated with Learning-Centered Beliefs

From Beliefs to Practice—The Story Unfolds

To begin to make sense of these findings, we return to the findings from the two pilot studies that preceded the AAEEBL adaptation. In these pilots, Brown et al. (2012) conducted random surveys of faculty at two institutions. In other words, unlike the AAEEBL survey, respondents were not necessarily ePortfolio practitioners. Additionally, it should not be surprising that respondents in the pilots at these two institutions were predominantly teacher-centered. Out of the 153 respondents, 18% were exclusively teacher-centered.

This is particularly notable since teaching beliefs are generally a blend of teacher, learner, and learning centered orientations. When the profiles of teacher-centered respondents were combined with those with different blends of teaching-centered beliefs (teacher-learner [11%] and teacher-learning centered [5%] beliefs), more than one-third of those reporting were all or partially teacher-centered in their teaching beliefs.

Further, it is reasonable to assume that teacher-centered beliefs are underrepresented in this number. Most faculty members still lecture (McKeachie & Svinicki, 2005), and we would not necessarily expect

Table 5
Retained Constituent Items Comprising Each Teaching Belief Construct

| | Factor Loadings | | |
| | Factor 1 (Teacher-Centered) | Factor 2 (Learner-Centered) | Factor 3 (Learning-Centered) |
Item			
I use a textbook to plan my course.[*]	.635	-.051	-.039
Lectures are important models of subject matter expertise.[*]	.813	-.082	.079
I focus primarily on information students will need to pass the exams.[*]	.560	-.113	-.082
When evaluating student performance, it is important to consider multiple examples of student work. [ˆ]	-.078	.348	.190
Instruction should be flexible to accommodate students' individual needs. [ˆ]	-.343	.627	.016
I am certain that I am making a difference in the lives of my students. [ˆ]	.234	.396	-.092
I encourage students to constantly check their own understanding while they are studying.[ˆ]	-.111	.660	.162
I am good at helping all the students in my classes make significant improvement. [ˆ]	.031	.726	-.083
My course activities usually require students to work individually.[*]	.332	.133	-.636
I encourage students to work together to solve authentic problems that students help identify. [†]	-.014	-.138	.733
I provide opportunities for my students to critique each others' work. [†]	-.226	-.240	.439
Many of my assignments require students to work in groups to arrive at correct answers and solutions. [†]	.237	.244	.738
I grade students' teamwork skills. [†]	.077	.284	.659

Note. [*] Item originally associated with Teaching-Centered Beliefs
[ˆ] Item originally associated with Learner-Centered Beliefs
[†] Item originally associated with Learning-Centered Beliefs

that those who respond to surveys about ePortfolios to be significantly different from their peers in their teaching approaches. The sample provided in this report is understood to be indicative of ePortfolio practice—an association rather than a bias.

However, by contrast, in the 2012 AAEEBL survey, not one respondent was uniformly teacher-centered. The difference begins to shape the picture of a population of educators who use ePortfolios and whose teaching epistemology is increasingly more learner and learning-centered than the general population of educators. When individual questions are broken out and responses allocated to the different beliefs (recall that most faculty hold a mix of beliefs), a full 77% of responses were either learner or learning-centered in orientation.

What does this mean in practice? Teacher-centered faculty report they are more likely to present facts to provide a foundation for a subject. Teacher-centered faculty articulate beliefs that they are more and almost exclusively likely to report on focusing their instruction on the information students will need to pass exams. Most assignments in teacher-centered faculty classrooms focus on individual work in comparison to those who collaborate on cross-disciplinary teams. Also, teams of faculty with stakeholders and peers are, by degree, even less likely to have students work individually than in cross-disciplinary teams.

What else pertains? One-way MANOVA results in particular are indicative of how ePortfolios are significantly altering the teaching landscape. Compared with teacher-centered traditions, learning-centered ePortfolio practitioners are significantly more likely to evaluate student work collaboratively, often on cross-disciplinary teams. They consider multiple examples of student work and value students' work over time.

Future Directions

There is more beneath the surface of this work with respect to the considerations of developing a valid and reliable survey instrument that has the potential to

contribute to and advance the research on ePortfolios. From a practical perspective, future administrations of the AAEEBL membership survey will focus on more effective and strategic subject recruitment, particularly of individuals with experience with ePortfolio initiatives in Student Affairs, the disciplines (such as STEM) and other subareas. We are also interested in exploring how common features across ePortfolio technologies (such as scaffolding for reflection, the use of multimedia, personalization, and the ability to maintain a social presence) might correlate with various demographic characteristics of programs as well as students. We plan to continue our efforts to develop and validate scales such as the teaching belief constructs that are associated with ePortfolio practices and could be used by other researchers to better understand the impact of other forms of learner-centered educational technologies.

We are only now beginning to excavate the implications and surface more and better questions to inform future administrations of the AAEEBL membership survey. What seems clear from these preliminary findings is that ePortfolio practitioners are indeed transforming their teaching practice. Whether this transformation represents practice that promotes critical reflection and learner agency remains to be determined. The evidence is nonetheless clear—a new practice is emerging.

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<div align="center">Acknowledgements</div>

Making Learning Visible with ePortfolios: Coupling the Right Pedagogy with the Right Technology

Heidi L. Johnsen
LaGuardia Community College

This essay captures one instructor's experience implementing, revising and re-implementing ePortfolio practices over several years at LaGuardia Community College, CUNY. It outlines and analyzes the strategies that have worked best in rendering more visible the learning process to students generally inexperienced in academic pursuits, namely (1) determining "learning" as the primary purpose of student ePortfolios, (2) helping students discover the language to talk about the learning process, (3) providing continual guidance to enforce critical and academic analysis, and (4) celebrating technological advances that have enhanced pedagogical changes. This process of experiment, failure, reflection, and success should be of interest to teachers and scholars concerned with using technology to empower learning among nontraditional students new to the college environment.

In 2003, at the first college-wide meeting I attended when I joined the faculty at LaGuardia Community College, part of the City University of New York, the college president shared sample ePortfolios that moved and inspired me. The year before, LaGuardia had started "a year-long process of development and classroom testing of ePortfolio processes" (Milestones, 2012), and the visual documentation of a student's progress through the college was enlightening: it made me excited to be in a place where very deserving students were valued and given the support necessary to achieve their goals. What I could not articulate then, but have since understood, was my excitement at seeing learning made visible. More than just watching a student's writing improve essay by essay, as I had in the past as an English professor, here was evidence of a more holistic form of learning: work from academic classes was linked to a personal narrative, which was in turn linked to reflections about progress. Here was a tool that seemed to have the potential to show students and other stake-holders—such as future educators, potential employers and supportive family members living near and far—not only what students had accomplished but also how they had reached their milestones and goals. What follows is an account of my efforts over the last seven years to help students demonstrate—to themselves and others—their learning holistically and effectively in ePortfolios. While the pedagogical changes I have made on my own and with colleagues over the years have unquestionably improved the final product, my experience highlights the essential role technology plays in accurately representing student learning through ePortfolios.

Overview of LaGuardia and ePortfolios

LaGuardia is a large, urban campus where students come from 160 countries, speaking 127 languages. Students are often the first in their family to attend college, and more than half of them need some form of remediation when they enter. For the underrepresented students who make up a majority of the community college populations like LaGuardia's, ePortfolios can provide a valuable narrative space, notes LaGuardia President Gail Mellow (Mellow & Heelan, 2008); ePortfolios allow "first generation and immigrant students to open up the academic process to family and friends, creating digital resumes to send to employers and transfer institutions, and connecting education goals with personal experience" (p. 113). Because administrators at the college understood that our students benefit from having a more complete assessment that ePortfolios could provide, they invested in faculty training seminars, designated computer labs, and support staff (Mellow & Heelan, 2008).

In keeping with advancing technology, in 2010 LaGuardia moved from the Blackboard 6 platform to a new platform system, Digication, which is creatively intuitive, socially interactive, and easily integrative with other media (Milestones, 2012). This was a needed change: the old platform required students to spend excessive time to create fully developed ePortfolios. My students were regularly overwhelmed by the Blackboard interface; they did not have the technological skills necessary to create the simplest electronic repository. Because of the difficulty of mastering the technology, most students were unable to engage in meaningful reflection of their work. Moreover, the categories established with the old system were difficult, if not impossible to change, which left the students with little control over how they represented themselves and often meant the work produced varied little from student to student.

Technical Difficulties Highlighted in a Learning Community

The technological difficulties I experienced with individual classes were multiplied when I connected

with two other instructors in a learning community, called a Liberal Arts Cluster. I suggested we use ePortfolios as a shared space between the three coordinated classes—in this case, First-Year Composition/Research Paper, Introduction to Philosophy, and Persuasion and Debate. The research on ePortfolios indicated a strong rationale for using them for this learning community; Weis, Benmayor, O'Leary, and Eynon (2002) suggest the "digital format transforms students' capacity to synthesize, interpret, theorize, and create new cultural and historical knowledge. In this way, digital formats potentially democratize learning and produce critical subjects and authors" (p. 153). Moreover, as Mellow and Heelan (2008) report, ePortfolios allow students to "do the critical thinking necessary to make intellectual connections across the disciplines and assignments, to publish authentic student work for review by peers and employers, and to conduct the critical reflection that changes information into knowledge" (p. 122). I recommended ePortfolios in the learning community to tap into all these possibilities.

Nevertheless, after a few semesters, my colleague in Persuasion and Debate and I (the third class was taught by several different teachers over the next few years) were still dissatisfied with the ePortfolios students created. The majority built ePortfolios that failed to show any connection between the courses, they were no more dynamic than a paper selection of the best work, and, in general, they lacked unity and a critically reflective voice. Additionally, I was frustrated with how passive students were in their own educational experiences; I wanted them to participate more fully and take ownership of their experiences by making connections with their lives outside of class and by recognizing their progress, the progress I clearly saw but they rarely acknowledged. I nonetheless remained convinced that ePortfolios would be an ideal tool to accomplish all of these goals.

The purpose of this article is to outline and analyze the strategies, pedagogical and technological, that have worked best in rendering more visible the learning process to our students generally inexperienced in academic pursuits. Through trial and error, my colleague and I have been largely successful at helping students make their learning more visible through the use of ePortfolios. Many of the conclusions we come to are similar to those described in "folio thinking" (Chen, 2004). First, we identify a clear goal or purpose for student ePortfolios, namely student recognition of their own learning, and we help students see from the beginning the connection between learning in and out of the classroom. From there, we help students discover the language and skills necessary to talk about the purpose and the process they will go through to demonstrate learning. Next, recognizing we must take a

coaching role for students to effectively internalize what they've learned, we provide the guidance necessary to enforce critical and academic analysis, especially as students try to represent learning in the multimedia genre that is ePortfolios. Finally, and perhaps most persuasively, this article argues the importance of using the appropriate ePortfolio platform to facilitate the students' efforts to represent their learning. This process of experiment, failure, reflection, and success should be of interest to teachers and scholars interested in using technology to empower learning among nontraditional students new to the college environment.

Blackboard 6 and First Tries

Incomplete ePortfolios

Through Blackboard 6, LaGuardia provided a seven-category template that encouraged multiple purposes. The categories—Welcome, About Me, Classes and Projects, Education Goals, Resume, Links and Contact (see Figures 1-3)—could be used to create ePortfolios for assessment, career/transfer, or learning. In this way, LaGuardia allowed for an "integrative ePortfolio" (Eynon, 2012, para. 6), or one that combined the above purposes. When I first used ePortfolios in the class, I knew they should document student learning, but beyond that, I didn't want to dictate a specific purpose for my students. Instead, I envisioned an organic process where students would figure out how they wanted to use an ePortfolio to best meet their needs, and I would guide them through the process. My intention to let students determine the focus of ePortfolio—and, therefore, their learning—was meant to empower them. However, this left first-semester college students unmoored in a sea too vast for them to navigate. Had there been enough time and guidance, my students might have eventually figured out for themselves how they wanted to use this educational internet space superficially similar to and yet quite different in intent and style from individual websites or the burgeoning social media sites, MySpace and Facebook, with which they were familiar. I soon realized that I could not cover the content of my class and provide students with enough time to explore possible purposes for themselves. In fact, there wasn't enough time in class for students to create complete ePortfolios, with appropriate work created for each category, let alone determine the overall intention of all the categories together as one unified ePortfolio.

The first screen shot (Figure 1) gives a typical example drawn from one of my students' ePortfolios. The "Resume" page in Blackboard 6 is incomplete, as are all but the first three categories. And in Classes and Projects, my students deposited only work from our one

Figure 1
A Blank "Resume" Page from the Blackboard 6 Platform

class. Even when I encouraged them, they did not deposit work from other classes they were taking at the same time. I had to change my expectations and re-think my pedagogy for ePortfolios. I narrowed the focus to be more like a traditional writing portfolio, where students selected their best writing from that first semester, reflected on their work, and, in general, set the stage of what would eventually become a bigger, more inclusive production that they would complete as they neared graduation. While this was not what I had in mind when I began working with ePortfolios, it was more realistic, and I was content knowing I was doing my part to create a whole. I did not understand how ineffective my strategy was until I saw the ePortfolios showcased by the college each semester; rarely did students include the writing they did in their first-semester writing class. Because career and transfer were the primary purpose of students at the end of their time at LaGuardia, they only wanted to include later, better work.

With the Liberal Arts Cluster, I had greater hopes that students would be able to create ePortfolios that, while integrating the work of all three courses, were whole or complete. As part of the organization of this particular learning community, students meet for an hour each week in what the school calls an "Integrating Seminar" in addition to meeting with each of the three clustered courses separately, and I hoped this would allow students sufficient time to complete an ePortfolio by depositing some work in each of the prescribed categories along with some kind of reflection, or at least introduction to the material. However, my colleague and I soon found that even with the extra hour, few students could complete an ePortfolio.

This is not to say that no learning occurred or even that the incomplete ePortfolios showed no evidence of the learning; there were signs of progress in many areas. But we were dissatisfied with what we were seeing. Despite extra time in class for students to create complete ePortfolios, most students in our learning community submitted ePortfolios with work in only a few categories instead of being able to create an ePortfolio that showed what they did accomplish in a semester. We started thinking about the categories themselves, whether they really represented our goals for the students. Even with the extra time the Liberal Arts Cluster allowed, students were rarely able to create purposeful ePortfolios that reflected their learning in a semester. We realized there had to be a substantial shift in the pedagogy—a clear goal, realistic tasks, supporting assignments, sufficient time and more guidance.

Difficult Technology

Additionally, one of the greatest obstacles was out of our control: the technology. One problem, as noted

above, was the rigidity of the categories: we could not easily change them to suit a specific goal. Because the technology for the old platform, Blackboard 6, was so difficult to master, we often spent a lot of time in class with results that were not as strong as we hoped. The "intermediate" ePortfolios my colleague and I asked students to create in the Liberal Arts Cluster meant more time had to be spent in class helping students try to use Netscape Composer or Dreamweaver, and few, if any, had ever used something that advanced before. It also meant that students were unlikely to work on their ePortfolios outside of class because it required expertise they did not have. LaGuardia provides labs where students can work on ePortfolios on their own time with the help of lab assistants, and students who took advantage of the labs had ePortfolios that were fuller and richer. But most students did or could not spare that time, and the resulting work reflected that.

Figure 2 shows the spreadsheet that was typically used in the category Classes and Projects. The design was meant to make the links between classes easy to see and to navigate. It was also set up to encompass multiple semesters, so there was potential for a more expansive view of a student's educational career. However, as was typical, this student never returned to the ePortfolio, so the work that was done looks incomplete in that big spreadsheet. Again, in the old system, it was very difficult for students to change this spreadsheet to only include the work for some courses. The spreadsheet holds the promise of a more comprehensive assessment of a student education, but in this presentation, the promise is broken. The one-size-fits-all model of the Blackboard 6 platform failed to let students accurately represent their learning in specific contexts.

In Figure 2 only one of the courses in the learning community is listed, the Integrating Seminar, which is typical. Most students in the cluster list all three courses, but even with a completed list, few had links with material in the Assignments section. Figure 3 is from the same student and is representative of the page the students created for the LIB110 course over the next few semesters. The writing on the page comes entirely from the college catalog descriptions of two of the three courses taken in the cluster. The links listed do work: the student provides one assignment per class. This typical ePortfolio, however, provides no context for the assignments beyond the fact they were assigned for the class. So the essay deposited for my class, for example, describes how the author sees herself, using definitions and self-analysis as evidence as one would expect in an essay called "My Identity." This three-page writing sample leaves the audience to divine why it is included here, how the essay connects to the course description from this page and how the integration promised by the page and course title are achieved.

The assignment deposited for Argumentation and Debate (later renamed Persuasion and Debate) is similarly void of context: after the title "Legalization Gay Marriage" [*sic*] is a 400-word essay that argues as the title suggests. Nowhere does the student explain her choices or attempt to make any connections between the essay and what viewers see in the ePortfolio while reading the essay. With the section titles across the page, an audience might reasonably wonder about other implied connections to those seven categories, and this was not addressed. Even when we, as instructors, asked students to write a reflection about each piece of work deposited, the Classes and Projects template itself discouraged anything reflective about the work because there is already so much information on the page. This static platform was limiting the way students represented themselves and the progress they were making. For years, as my colleague and I watched our students struggle with the technology, we knew we wanted more from the old platform, but we did not realize how much the right ePortfolio platform could help students make more visible their progress until we began working with the new system.
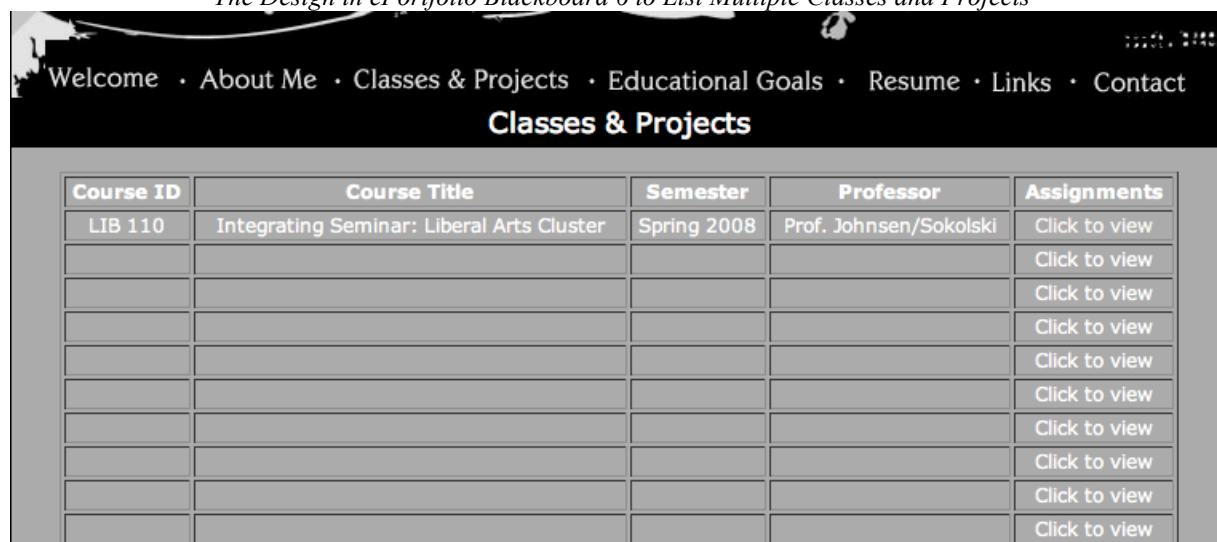
As instructors, we made changes in class, like allowing more time for students to do their work, adjusting the focus of the ePortfolio, and providing continued guidance throughout the process. This process is discussed in the next section. Nevertheless, our pedagogical changes would not have been sufficient had LaGuardia's new platform system not made the technological process of creating and depositing work easy. The new platform better allows students to represent work they have done instead of always looking to a future ePortfolio they might create by the end of their time at LaGuardia. With the new system, students can also include multiple media in their presentations of their work, nimbly navigating between, around and through material as they grappled with their own learning and created new knowledge in the process.

Learning Made More Visible via a New Platform

The Learning Portfolio

As I researched ways to improve my approach to ePortfolios, specifically in the learning community, I came across Zubizarreta's (2004) "The Learning Portfolio: Reflective Practice for Improving Student Learning." Central to Zubizarreta's (2004) argument is that by making "learning" the central theme of any class, instructors can persuade students come to appreciate and understand their own learning processes and experiences more completely. Making learning visible is one of the key reasons I was drawn to ePortfolios in the first place. ePortfolios can demonstrate what students have learned because, at
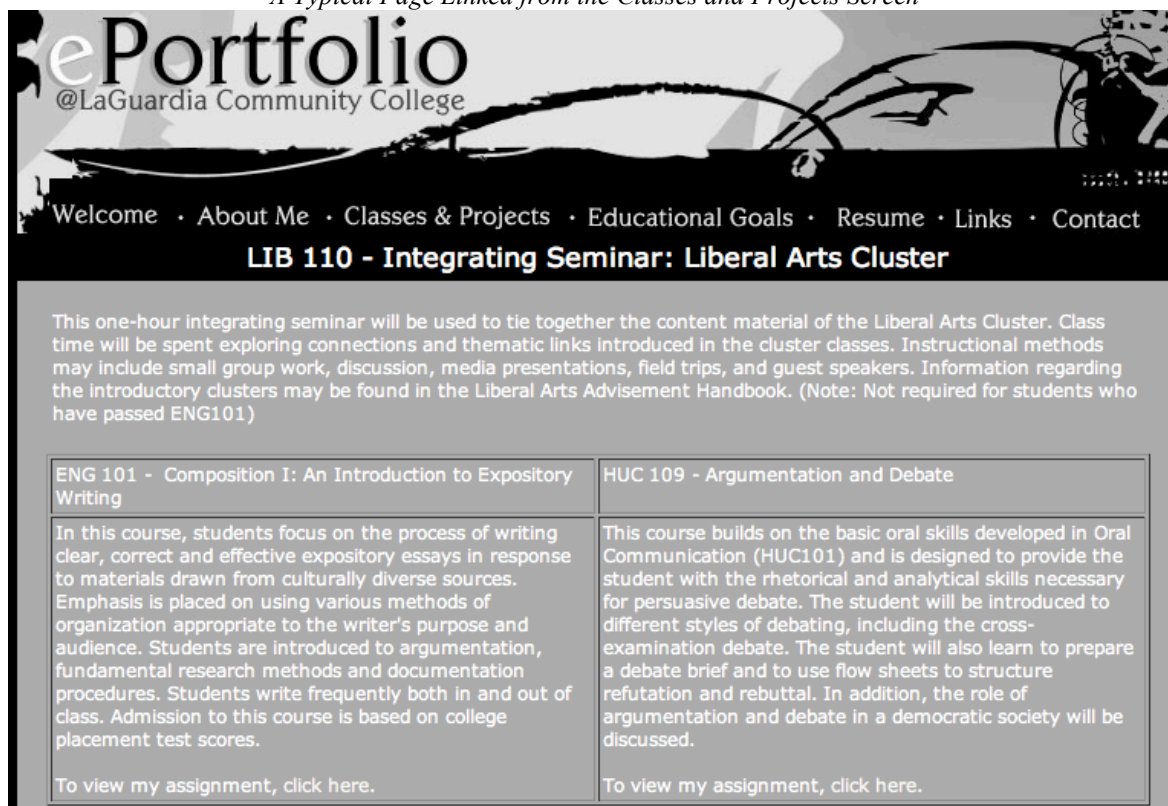
Figure 2
The Design in ePortfolio Blackboard 6 to List Multiple Classes and Projects

Note. Most of my students turned in incomplete lists using this system.

Figure 3
A Typical Page Linked from the Classes and Projects Screen

Note. Everything on this page comes from the college catalog.

their best, ePortfolios make visible the production of knowledge. I hoped an ePortfolio dedicated to learning would encourage students to understand the work they do in class in terms of new knowledge created and internalized. By applying Zubizarreta's (2004) key idea and creating a modified version of his suggested categories for collecting material—philosophy of learning, relevance of learning, assessment of learning, and learning goals—my colleague and I in the learning community hoped to foster an atmosphere where students felt comfortable using a meta-language for talking about learning, and thus would become more aware of it as it happened.

Essentially, the ePortfolio would show the student and outside readers the progress she/he had made in one semester through arguing that the student had experienced real learning according to the student's own definition. The evidence would be the ePortfolio itself, using Zubizaretta's (2004) categories as an organizational device and providing unity through reflective context. More than this, we would aid students in producing new knowledge as they contemplated how their identity is shaped by their learning, something similar to what Batson (2011) calls "transformational learning" (p. 110). By providing students with the "background and methods necessary to get students started on their own work in that field" (Batson, 2011, p. 112)—in this case the field of learning—we meant to provide opportunities for a real transformation to occur.

Step-by-Step Reflection

However, we ran into problems pretty early for reasons that echo what Batson (2011) describes when discussing current learning theories: "Current theories, in most cases, envision a shift in agency from the teacher to the students. This vision is very hard to actualize if students have no tools to assume agency or to conform to institutional demands for assessment" (p. 111). If we wanted students to engage in or analyze their own learning, we needed to provide guidance to discuss learning in very explicit terms, to consider multiple definitions and to write about their learning often. We started small: I added to the frequent freewriting I ask students to do as part of a composition pedagogy by asking students to do a focused freewrite at the end of every week, reporting on what they had learned in their classes. This reflective exercise was intended to tap into the benefits of reflection, such as: thinking critically about successes and failures in learning and using that information at a future time (Hopkins, 1997), creating metacognition about learning (Saito & Miwa, 2005) and demonstrating deeper learning (Boyle, Duffy, & Dunleavy, 2003). However, these freewrites began as lists for most students, lists of

the topics that had been covered by their professors. So we, their professors, had to encourage students to define learning for themselves, specifically to determine if covering a topic in class meant learning it. We allowed students the room—time and space—to examine their own life experiences to construct their answers. We offered more support in the form of an hour-long class discussion about defining learning, where students read a dozen or so definitions given by others, famous and not, and then were asked to come up with a working definition. This definition would be the frame for the learning ePortfolio we were asking them to construct. Many students had a definition similar to this one:

> I know that I learned something when i can recalled the discussion and i am able to make the information work best for me, and I can put the information to use, also when it has affected/changed my view point on a subject. [*sic*] (see Figure 4)

Though this student struggles with spelling, punctuation, and capitalization, among other non-standard language uses, her content clearly demonstrates the principle that as students reflectively use the tools given them, a shift occurs from a list of topics covered, to the necessity of real-life application.

I use the above student definition to illustrate the benefit of instructional support as a way to foster academic rigor. However, without careful support, and sometimes even with it, students do not always make new or productive connections that lead to knowledge. Simply depositing artifacts in a space does not represent learning. This has been an important point to make with students at all stages of creating the ePortfolio. Figure 4 is a screen shot of the page where the above definition came from. At the left-hand side are the weekly reflections in the order the student wrote them. Most students posted their weekly learning reflections—in the form of barely revised freewrites—in the Evidence of Learning category of their ePortfolio, as this student did. And the information found in the six or seven reflections are what led the student to come to her own, refined definition of learning, but nowhere does she explain that. In fact, there is nothing to indicate what "week 1 (3/23)" and the rest of the list means, or that, in the center of the page under "3/17/11," is perhaps the first reflection she wrote. Including every focused freewrite in answer to the prompt "what did you learn this week?" is not necessarily a bad choice. Research by Dalal, Hakel, Sliter, and Kirkendall (2012) indicates ePortfolios are a "good medium to collect reflections" because they provide students "the ability to critically evaluate the learned information and assist students in actively learning the information rather than relying on rote memorization" (p. 80). This example does not

Figure 4

Evidence of Learning (one category) in the Learning ePortfolio Students Create in a New Platform, Digication

indicate the student has been able to "critically evaluate" the information yet. Rather, Figure 4 shows it is not enough to simply deposit information. There may be any number of sound rhetorical reasons to include every general learning reflection written during a semester, but without some guidance from the author, a reader of this text is left to construct her/his own meaning. I would argue that the very design of the ePortfolio does some of the work for students in making the connections here between the Evidence of Learning category and what is written under the dates listed, but this great benefit can feel like a liability as it may prevent students from seeing the missed links in their own argument. Perhaps students are so satisfied with their mastery of the technology and the beauty of the presentation that they forget they have to make an argument or "do the work" of an author, as I phrase it, of making connections explicit.

Figure 4 is another example of this: the graphic is a drawing of a circular process, and it includes words the students in our learning community certainly heard from us, the instructors: "reflect and plan," "collect student work," "determine need," and "extract and record evidence." It is not completely clear from studying the graphic the kind of process it is meant to illustrate, nor is it clear how the student thinks the graphic connects to either the term "evidence of learning" or the freewrites she has listed. I have no doubt my student thought the connections here were clear, which is why feedback from a more experienced teacher is so important. As this student's instructors, my colleague and I spoke numerous times about the importance of including graphics in the visual media of ePortfolios, as well as the greater importance of explaining precisely how a graphic fits in the overall presentation of the page. We also explicitly stated that if students were to use their weekly reflections as evidence of learning, they would have to clearly show the reader how the evidence proved the claim, as with any persuasive piece. And yet many students struggled to do this effectively. We learned that more support and time are required (e.g., more examples, pointed discussions, individual consults) something we hope to provide the next time we work with students to construct a learning ePortfolio.

Student Choices vs. Responsible Interventions

Much of what I describe above happens because students are less experienced readers of texts; they have not read as often or as critically as English professors have. Students accept this as fact when considering written texts. An additional challenge in working with ePortfolios is that this generation of students feels very comfortable with social media, a great benefit in the technological design of an ePortfolio, but that same comfort can often hinder students from examining other identities they may have—specifically the academic self that asks them to move beyond short, personal posts or responses (even more common as Twitter dominates communication), to integrate new information in a critical or thoughtful way. For example, the common and necessary discussion about appropriate photos in an ePortfolio illustrates this very well. From the onset, students understand that the ePortfolio required for the academic class, cluster or program will necessarily look different than their Facebook page because the audience and purpose of each is different. Yet, instructors must continually guide students in thinking about how they represent themselves, especially with personal photographs. Without including any visual examples that might violate student privacy, I can speak of countless experiences counseling students to remove photos taken at a party with a beverage in a plastic cup, photos where more skin than clothing shows, photos with a provocative facial expression, or some combination of the three.

While we may value trusting our students, as Batson (2011) argues above, as inexperienced readers, students often require instruction about intention versus reception from us. It is a difficult balance to strike between encouraging student choices (and their developing identities) and responsible intervention, and miscalculations will occur. The discussion itself between students and teachers about how to represent personal connections with learning can be highly productive in that it forces students to defend, and therefore better understand, the choices they make. The reflective practice encouraged in portfolios supports this. The danger remains that students will not integrate new information sufficiently to create new knowledge but will get stuck making surface-level observations that do not engage larger academic conversations.

Though instructors may never be able to give students all the guidance and time they (i.e., both instructor and student) would like, through focusing on learning in the ePortfolio and providing students sufficient time and help, we have seen some good results in our learning community. Let me offer now some examples of students who found, through reflection, connections between their learning inside the

classroom and what was happening in their lives. I see in these examples new knowledge being produced, new voices developing, and specific connections to larger academic conversations about the learning process. One student writes:

> This semester I have learned that topics I fully remember are ones I've had personal experiences with. I remember more about theories and philosophies [because of] my reflections I've had to write and form an opinion on, than remembering the MLA style of an essay.

Her experience supports the notion that facts must be made personal, or at least connected to the personal, to be remembered or learned. The student clearly notes the limits of rote memorization to effective learning when she cites the MLA rules of documentation. (This example also provides me, the teacher of the MLA style, feedback about how to teach this subject in the future.)

Learning Inside and Outside the Classroom

The other examples also emphasize connections between the classroom and elsewhere. My colleague and I fostered this connection throughout the semester by asking students to think about what they were learning outside of the classroom. Around week three when students were writing their weekly "learning reflection," we added to the questions "What did you learn this week?" and "Where did you learn it?" We urged students to think about the things that were happening outside of the college campus and to consider if those experiences translated to learning, and, if so, how learning outside of class connected to learning in the class. Below are one student's thoughts:

> What I learned this week was that I really need to step up my game, and stop coming into class so late, meaning my English class. I need to turn in all of my late assignments and stop putting things off to the last minute. If I continue this type of behavior then I'm going to fail my classes and then lose my financial aid which is not good because I won't be able to pay for school considering my situation. . . . Then I'm going to start getting ready at night for school, so I can get to class on time. That way there won't be any more trouble.

Two weeks later the same student wrote, "What I learned this week was how to get to school on time I finally figured out a system that works best for me." None of the three clustered courses that semester had time management or homework strategies as its topic, but the national focus on student retention has

highlighted the essential role these kinds of issues play in the success of college students. In a classroom, my colleagues and I may bring this up over the course of the semester, but it was in thinking about what she was learning in her life that this student realized the clear connection between the two. By choosing to include this in her ePortfolio, the student is not only giving an illustration of the acquisition of new knowledge, she is also giving her audience a glimpse of her as a whole person, not just as a student—a view that does not exist in traditional modes of learning and assessment.

Though there is much evidence in my students' ePortfolios of personal growth, critical thinking and reflective learning, this example shows a student who began to see himself differently outside of the class because of what had happened in the class. He writes:

> I was kind of shy and didn't want to talk the first day of class, because I was afraid that I would say something wrong or I may not have made sense. The weeks went by and things started to change. On the 11th week, I was more brave and asking a lot of questions. I am more active in conversations now and I am not afraid to be wrong among my companions and family when I give an answer. . . . My wife told me and other family member that my college studies have really changed me.

Like this student, many offer evidence from outside of the classroom of their learning during our semester together. Many examine their lives through the lens of learning theories and rhetorical discussions of voice and find the best evidence they have of their learning may not be found in an essay written or assignment turned in. The ePortfolio gives students the space to include all of these things as evidence of learning. One student, writing about the connection between her own learning process and ePortfolios, says, "I believe that the e-Portfolio reflects my overall learning process [because] it's my voice on the website, it's not a paper and the whole thing is based on the voice of the student." Here the student claims her own learning process. In the cluster ePortfolio, there are categories to fill (though we try to make clear the categories are flexible, students have never changed them) with assignments from professors, just as any college class, but in the process of choosing which assignments to include and how to present them, the student feels she has enough control over the content to say "the whole thing" is her own. The phrase "it's not a paper" may seem unclear here, but this is a comment about the technology: without the technological possibilities of an ePortfolio, this student suggests, the representations of learning would be more limited or flat, like paper, and not as accurate. Overall, students more consistently demonstrate growth because of and through the use of their learning ePortfolios.

Conclusions

The past seven years working with ePortfolios has shown me the great potential they have to help students internalize and recognize their own learning. ePortfolios provide a larger audience with whom students might share their lives and offers students an important way to be seen and heard. As students create and share their ePortfolios, they make visible their learning, for themselves and others, allowing them to celebrate their life experiences and the new knowledge they have produced. This kind of learning will most likely occur, I have found, if students (1) have a clear purpose for their ePortfolio that students can achieve in one semester, in this case documenting learning so they realize how much they have progressed in just three months; (2) have the language to describe and reflect on learning; (3) can clearly demonstrate in the ePortfolio a holistic view of their learning, meaning the connection between what they learn both in and out of the classroom must be clear to the audience; and (4) have access to technology that allows them to focus on the content of the ePortfolio instead of its construction. When LaGuardia switched to a newer, sleeker platform, more students had the time and ability to effectively make that argument. That has been the most revolutionary change in our student ePortfolios because of the new platform: more than twice the number of students can present a complete or nearly completed ePortfolio at the end of the semester compared to those submitted before the change in the platform. Now most students have the ability to craft a complete argument about their learning, rather than submit ePortfolios with few documents and little reflection or cohesive argument. Because of the changes to the ePortfolio platform, my colleagues and I can now concentrate on the content, on helping students make all the material included in their ePortfolio stronger, clearer and more relevant. With the right technology coupled with the right pedagogy, the learning students can represent in ePortfolios is not only visible: it is dazzling.

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Using the ePortfolio to Complement Standardized Testing in a Healthcare Professional Program: Better Education or More Busy Work?

Clarence Chan
LaGuardia Community College

This article evaluates the full-scale integration of the ePortfolio into a healthcare professional program in an open admissions community college in the United States. The Physical Therapist Assistant program in question struggles to balance the dynamic tension between preparing students for a summative multiple-choice licensing examination and the continuous development of professional core values such as altruism and integrity—qualities that cannot be measured by any standardized test. To address this conflict, the program has piloted the ePortfolio as a pedagogical tool that enables students to reflect on their development of professionalism and to make connections between academics, clinical practice, and personal developments. From the program's perspective, the integration of the ePortfolio has been somewhat successful. The ePortfolio has allowed faculty to go beyond the otherwise "test prep" curriculum and creatively design assignments to help students understand and cultivate professional values. Yet, in an open admissions institution where students come with an elevated level of unpreparedness, the ePortfolio is not a panacea for a professional program with highly stringent graduation and licensing requirements. After the implementation of the ePortfolio, faculty and students continue to confront the dilemma of test preparation and the development of professional qualities— albeit with new dynamics. Our experience in balancing the needs to "teach to the test" and to develop a well-rounded student body has relevance to the ongoing national debates on ePortfolio and standardized testing as pedagogical and assessment tools in higher education.

One of the greatest challenges that a healthcare professional program faces is the dual goal of preparing students to pass the licensing examination and educating them to be clinically competent practitioners. These two goals are not necessarily compatible. Students who understand and retain academic knowledge may pass the multiple-choice board examination at the end point of their education and be awarded a professional license. However, contrary to what standardization advocates might want the public to believe, passing the standardized licensure examination alone does not guarantee professional competencies such as those required for physical therapists: accountability, altruism, compassion/caring, excellence, integrity, professional duty and social responsibility (American Physical Therapy Association, 2003). In fact, as the ecology and the practice of the healthcare system in this country have become increasingly corporate, educators of healthcare and medical programs are called to focus more attention to professionalism and ethics as related to service delivery (Davis, 2009; Fard, Asghari, & Mirzazadeh, 2010; Geddes, Salvatori, & Eva, 2009; Hayward & Blackmer, 2010; Relman, 1998). Therefore, in order to be accredited by their respective professional organizations, healthcare professional programs cannot merely focus on test preparation. They must instead develop and sustain an integrated curriculum that not only imparts textbook knowledge but also fosters essential professional qualities. They are also required to maintain a mechanism to document and evaluate many aspects of student learning that cannot be captured by the standardized licensure examination.

But it is not easy to balance test preparation and the development of intangible professionalism as healthcare programs embrace non-traditional students who come with high levels of unpreparedness. The Physical Therapist Assistant (PTA) program at LaGuardia Community College, City University of New York, for instance, almost lost its accreditation because of low pass rates of the recently required National Physical Therapy Examination (NPTE). Yet, in its struggle to help disadvantaged students pass the standardized test, the program became overly "test-prep" and needed to balance the curriculum and re-orient itself to developing students' other professional competencies. To balance the curriculum, the faculty has explored and integrated the ePortfolio into the entire program as a major pedagogical intervention. In addition to preparing for the NPTE, students need to develop their ePortfolio, based on the program's template, to reflect on how they attain key PTA competencies throughout their tenure in the program. The program has five years of experience in piloting the ePortfolio.

The purpose of this article is to evaluate the ePortfolio as a pedagogical tool in helping a healthcare professional program implement a balanced curriculum that develops professional competencies in students while preparing them for the licensing examination. I begin the essay by discussing the test-prep orientation the PTA program adopted to prepare students for the newly introduced licensing examination and the challenges and dilemmas such an orientation had brought about. I then discuss how the program readjusted its curricular approach by exploring and piloting the ePortfolio in two introductory clinical courses for the purpose of counter-balancing the "test-prep" approach. From this pilot, I found that without

a clear programmatic structure students could not fully benefit from the ePortfolio. Next, I describe the development of a program-wide template to integrate the ePortfolio in all aspects of student learning. This template guides students to construct an ePortfolio that makes connections between academic, clinical, and personal developments. Finally, I conclude the essay with a reflection on the ePortfolio as a pedagogical tool in balancing the NPTE preparation and the continuous development of professional qualities, focusing on our continuous challenges. This reflection has relevance to the ongoing national debates about the tension between standardized testing and ePortfolios as pedagogical and assessment tools.

Surviving the NPTE

The PTA program is part of LaGuardia Community College located in western Queens of New York City, one of the most demographically diverse counties in the US. As an open admissions institution, LaGuardia Community College does not select its students based on their demonstrated potential to graduate. Instead, it embraces a student body who is "by any statistical category such as race, ethnicity, lack of academic preparedness, poverty, [family obligations], or immigration status . . . not only the hardest-to-serve, but the least likely to succeed" (Mellow, 2008, p. 8). Since the PTA program, like the college's other healthcare professional programs, does not participate in the student selection process but admits students based on a fairly low GPA requirements of four core courses, most incoming students are faced with multiple challenges in meeting the rigorous graduation requirements and developing the necessary clinical and professional competencies. Some students, for example, must translate over 80% of the words in the textbook into their native language to study for a test. Many juggle several low-paying jobs, family commitments, and a full-time curriculum while trying to avoid dropping out of the program (for a more detailed student profile, see LaGuardia Community College, 2011). Prior to 2003, when the NPTE was not a requirement for PTA graduates to obtain a license in New York State, our faculty had already exhausted their resources and time to help these students graduate and enter the profession. The inception of the NPTE in New York State in 2003 presented a monumental challenge to the program, threatening not only the faculty's ability to prepare students to become effective PTAs but also the very survival of the program itself. In addition to the immediate pressure of having to ensure students pass the high-stakes examination, the Commission on Accreditation of Physical Therapy Education (2011) also stipulated a requirement of an averaged three-year NPTE pass rate of at least 80% for all PTA programs (p. A33). Failure to comply means that a program may face a suspension on student admission and

even the threat of losing its accreditation. LaGuardia Community College's PTA program was unprepared to face such a challenge; its first three-year NPTE pass rates were well below 80%.

To meet the NPTE requirements, the PTA program had no choice but to drastically increase the weight of examinations, rendered in the NPTE multiple-choice style, as the ultimate graduation requirement. Faculty and student attention shifted from the development of clinical and professional competencies to NPTE contents and test-taking strategies. This curricular change brought about mixed results. On the one hand, the PTA program improved the NPTE pass rates within a few years, thus satisfying the CAPTE requirement. Yet, on the other hand, the program became like a cutthroat "cram school" in which students viewed the NPTE as their sole educational goal and found little interest in developing professional core values. They complained that any assignment or activity cultivating such values other than "test-prep" was "busy work," unnecessary "add-ons" that further stretched their already limited time and energy for academic studies. The PTA program was thus confronted with the dilemma of preparing students for the licensing examination and educating them to be clinically and ethically competent practitioners. The program realized that further intervention was necessary. The intractable reality of standardized testing and the elevated levels of unpreparedness among LaGuardia students challenged the PTA program to overhaul its pedagogy and curriculum.

The ePortfolio as a Pedagogical Intervention

To counter-balance its test-prep pedagogy, the PTA program explored and piloted the ePortfolio in 2007. This pilot was developed in tandem with LaGuardia Community College's experiments in using the ePortfolio to enhance student engagement and learning (Arcario, Eynon, & Clark, 2005; Ramírez, 2011). LaGuardia has pioneered the ePortfolio as an intellectual process and scaffolding that promotes "integration of student learning over multiple classes within an electronic framework" (Mellow & Heelan, 2008, p. 112). "The best ePortfolio programs," according to LaGuardia's president, "offer students a way to collect and showcase accomplishments, and then require students to make personal intellectual connections through a reflective process" (Mellow & Heelan, 2008, p. 113).

First ePortfolio Pilot

To launch the pilot, the PTA program used the common ePortfolio template developed by LaGuardia Community College based on the Concord platform (Figure 1). Based on the template, students were asked to develop their PTA professional ePortfolio when they

Figure 1
LaGuardia Community College's Early ePortfolio Template

took the introductory clinical courses. On the most basic level, students were expected to present their ePortfolio with four sets of information. "About Me" was students' self-introduction, while their mission or vision of becoming a healthcare professional should be articulated through the "Educational Goals" section. Every ePortfolio must also present a list of classes and projects as evidence of student learning. Lastly, students had to include a resume as a connecting point toward graduation. In the span of three semesters between Fall 2007 and Fall 2008, three different classes of PTA students took part in the ePortfolio project.

The educational goal behind this first ePortfolio pilot was to cultivate and develop professional competencies such as critical thinking, oral communication, technological literacy, and professional core values—competencies and values that cannot be measured by the multiple-choice questions of the NPTE. We hoped that the logical and flexible template of the ePortfolio would enable students to make meaning and connections out of the mire of general education and clinical courses that are otherwise fragmented, to think critically about their physical therapy practices when the healthcare field is rapidly morphing into a corporate business, to

communicate their goals and professional work clearly and effectively to the general public, and to nurture their ethical selves by connecting their academic learning, clinical experience, and personal aspirations.

Although the PTA program did help students develop ePortfolios, we found the quality of ePortfolios disappointing after 18 months of piloting. Simply based on the level of completion, most of the submitted ePortfolios were deemed "unsatisfactory." Based on a grading rubric in a ten-point scale that evaluates the four sets of information presented in the ePortfolio at the time of graduation, a large number of these ePortfolios scored well below the passing grade of seven (see Figure 2, First Pilot Period). In fact the combined average of all the ePortfolios collected were 4.9 with only a little over 30% of the students who scored a seven or higher (see Figure 3, First Pilot Period).

Issues of early ePortfolios. Three key issues were identified to explain the poor quality of the ePortfolios collected during the first pilot. First, because the ePortfolio template allowed a high degree of flexibility in design, without a specific format or direction as to where and what to put into the portfolio, students were at liberty in deciding on the content and in designing the look and feel of their ePortfolio. The type and

Figure 2
Average ePortfolio Score in a Ten-Point Scale During the First Pilot (Fall 2007-Fall 2008) and the Second Pilot (Fall 2010-Fall 2011)

Average ePortfolio Score

| | Fall 2007 | Spr 2008 | Fall 2008 | Fall 2010 | Spr 2011 | Fall 2011 |
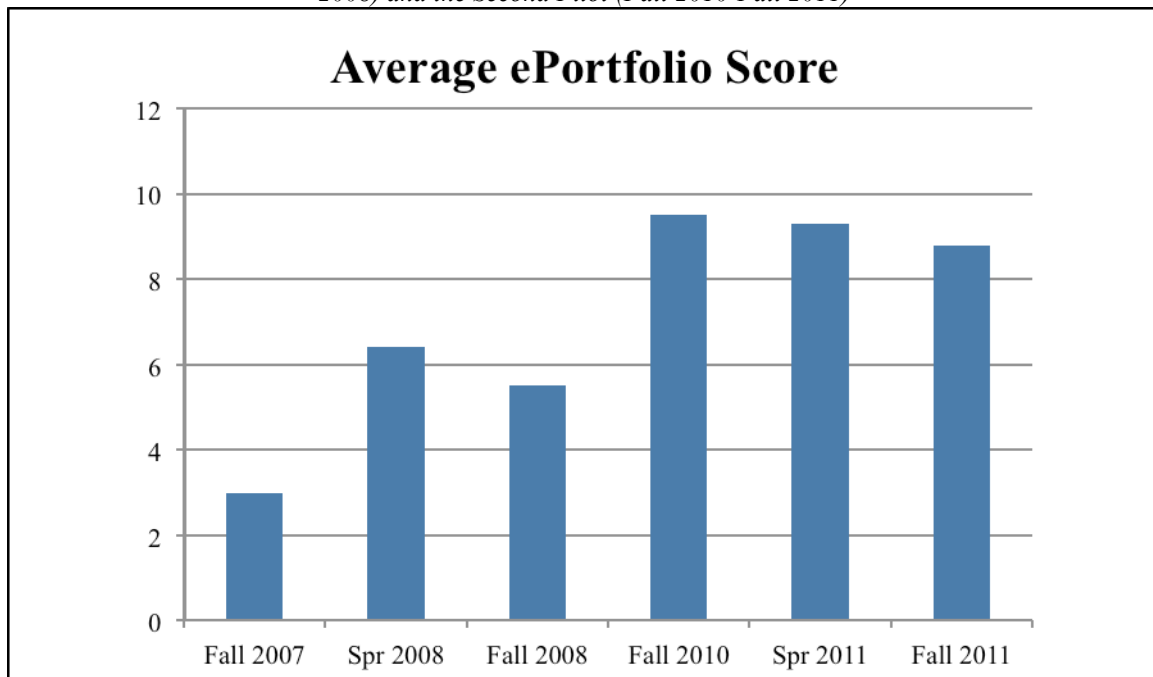
Figure 3
ePortfolio Pass Rates During the First Pilot (Fall 2007-Fall 2008) and the Second Pilot (Fall 2010-Fall 2011)

% of Passing ePortfolios

| | Fall 2007 n=7 | Spr 2008 n=17 | Fall 2008 n=20 | Fall 2010 n=15 | Spr 2011 n=12 | Fall 2011 n=13 |
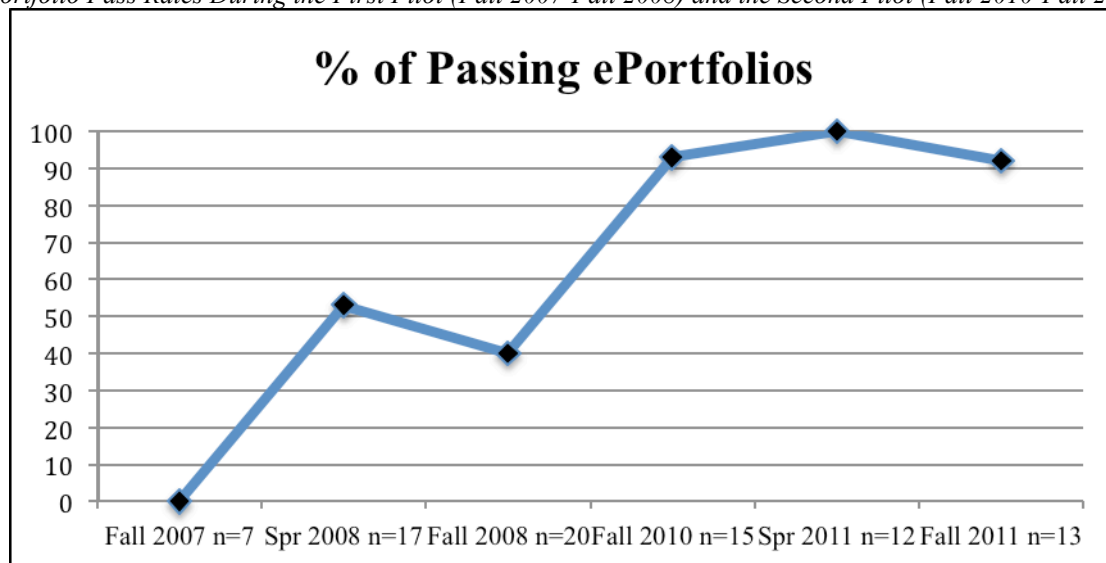
quantity of materials found in their ePortfolios were highly irregular and the quality of the ePortfolios also varied significantly. Many of the ePortfolios contained a superficial assortment of content and information about the authors. Some students revealed very little of their experiences, while others were less mindful about the appropriateness of their content, which might be in conflict with the physical therapy core values. For example, it would be highly undesirable for a PTA student to present photographs featuring casual or social context in the professional ePortfolio (e.g., photographs taken at a bachelor party in Las Vegas).

Second, despite the intention to provide an intellectual platform and process in which students

could integrate their learning over multiple classes, most of the PTA students were simply presenting a list of courses taken. Some of them did not even provide an adequate number of assignments or activities as evidence of professional growth. An ePortfolio with merely a list of courses and a handful of assignment artifacts can hardly be considered an effective learning tool; nor can it satisfy the PTA program's goal. The ePortfolio of the student E.A. is a case in point (Figure 4). It was nothing more than a repository of class assignments and projects. No evidence of connections could be found in her ePortfolio.

Third, these early student ePortfolios demonstrated a lack of connection to their own personal, social, and professional developments. The students failed to make the connection between the information presented in "About Me," "Education Goals," and the list of classes and projects. They did not show how their personal attributes were further developed through the clinical classes and projects that led them to achieve the competencies expected of a clinician. Nor did they make connections between their lived experiences and their academic learning to document their professional development in a holistic way. The ePortfolio of the student C.H. from the class of 2008 was one of the best among the early ePortfolios, but she could hardly capture the meaning and intent of an integrative learning ePortfolio (Figure 5). Her ePortfolio simply presented a longer and more comprehensive list of class projects with little reflection on her educational process.

Reflection on the First Pilot

Although the PTA program was successful in facilitating the construction of student ePortfolios, the pilot demonstrated that it could not achieve the PTA program's goal in promoting key professional competencies and core values among students to counter-balance its recent "cram-school" teaching approach. This pilot yielded two important observations. Although a generic, flexible ePortfolio platform may facilitate individual creativity, it lacks the structural guidance that is necessary for capturing professional growth. More importantly, even though students used the ePortfolio to collect and present their work, they were not able to make and deepen connections between the courses they took and between academic work and life experience. The pilot suggested the need to have an ePortfolio system that can provoke a more integrative, thoughtful, and intentional learning process to nurture their ethical selves, as students are tempted to narrow their focus on textbook knowledge and test-taking skills. The best ePortfolio must be able to help PTA students relate core professional values to clinical knowledge and personal experience. But how?

Program-Wide Integration of the ePortfolio

To answer this question, the PTA program decided to move the ePortfolio from a course-based use to a program-wide integration. The benefit of using the ePortfolio with a programmatic integrative approach can best be understood through the concept of "folio thinking" (Chen, 2009). It surpasses the concept of simply using a portfolio to document and present one's accomplishments. According to Brown, Peterson, Wilson, and Ptaszynski (2008),

folio thinking is a pedagogical approach that reaches beyond the technology to support reflective and transformational uses of e-portfolios. In this approach, the e-portfolio becomes a space to reflect on learning and demonstrate growth . . . the folio thinking portfolio documents process as much as product. This tendency reflects folio thinking's emphasis on metacognition and documentation of learning growth over time, processes rarely captured in conventional approaches.

Program-Specific ePortfolio Template

Perhaps one of the most significant steps towards the PTA program's complete integration of the ePortfolio was the development of its program-specific template that replaced the previous generic college-wide template. This template was developed when LaGuardia was adopting a new ePortfolio platform called Digication. With the help of the college's ePortfolio technology team, the PTA program revised the original template to link its entire curriculum to both the college's general education core competencies (Critical Literacy, Quantitative Reasoning, Oral Communication, Research and Information Literacy, and Technological Literacy) and the American Physical Therapy Association's professional core values (accountability, altruism, compassion/caring, excellence, integrity, professional duty, and social responsibility). The new template contained several key components that helped students demonstrate and connect the above competencies and core values (Figure 6):

- Home (or Introduction: About Me)
- Mission Statement/Personal Goal
- Classes and Projects
- Professionalism and Ethics (or Professional and Community Activities)
- Resume
- Links
- Contact

While the "Home" page offered gleams of students' background and history of their academic experiences,

Figure 4
ePortfolio of the Student E.A., First Pilot Period
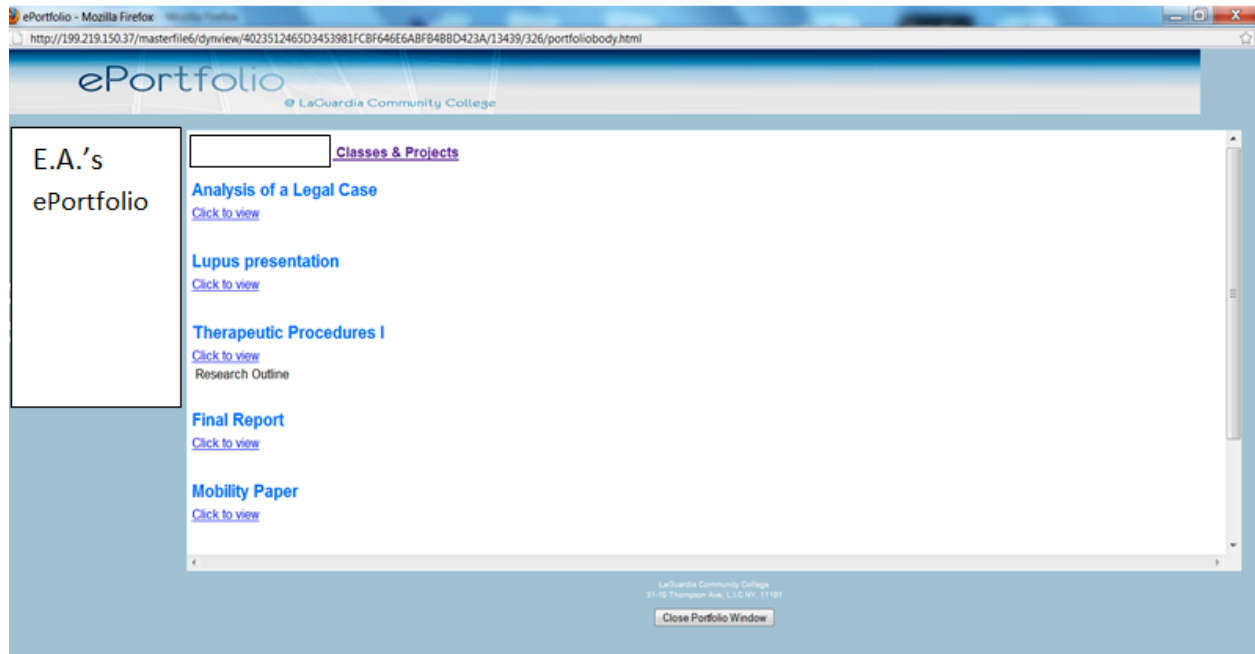
Figure 5
ePortfolio of the student C.H., First Pilot Period
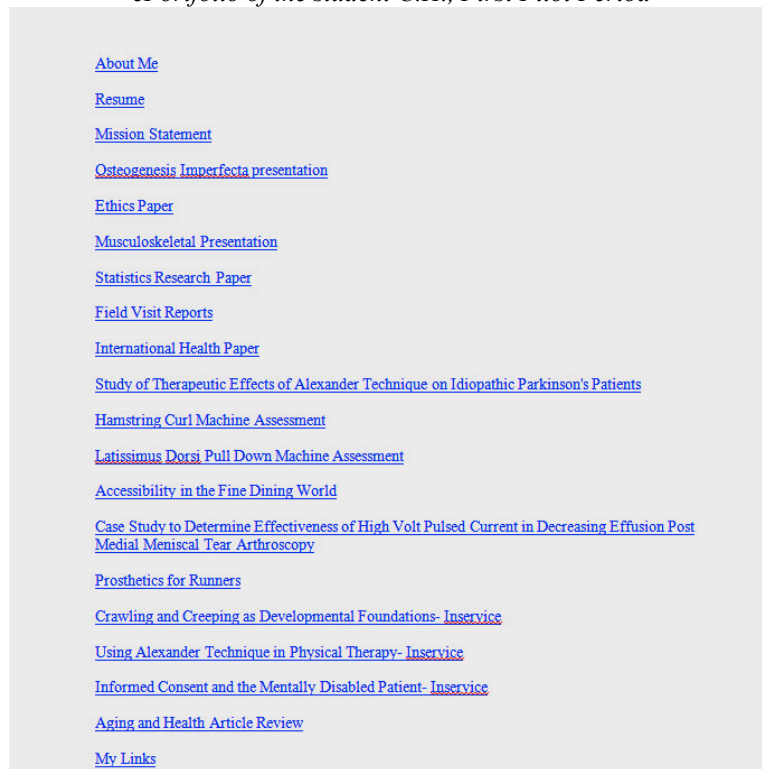
Figure 6

The Revised ePortfolio Template of the Physical Therapist Assistant Program of LaGuardia Community College
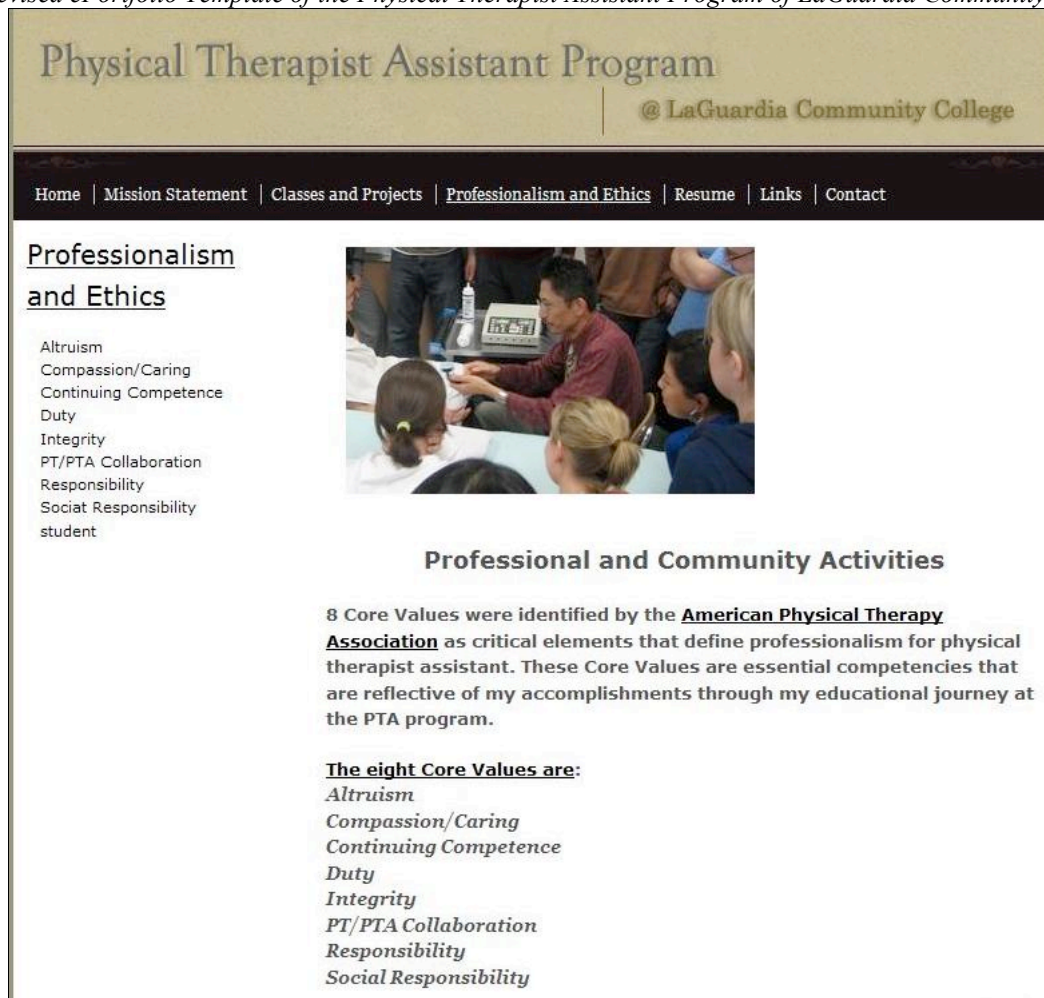
the "Mission Statement/Personal Goal" page allowed students to articulate their goals and vision on how they could become the healthcare professional that they aspired to be. Students' academic and professional engagement could be found in the "Classes and Projects" and the "Professionalism and Ethics" or "Professional and Community Activities" pages. These two pages contained artifacts and evidence of students' academic, clinical, and other professional experiences.

To facilitate their reflection on these learning experiences, students were expected to write a short narrative to describe and connect how the selected artifact reflected the attainment of the chosen competency. A similar approach was used for the "Professionalism and Ethics" page. Students presented evidence that demonstrated how their personal and professional experiences reflected or supported those same competencies. A key feature of this program-

specific template was the development of the competency grid (Figure 7). In order to help students make meaning out of their learning activities and make better connections between the course assignments and the education and professional competencies, an assignment grid was designed to allow students to select their own assignments or projects from any courses that could best demonstrate each of those competencies. The grid not only functioned as a guide to help students organize their academic and clinical course work in a single page, it also enabled them to show and track their achievements throughout their tenure at the college. In addition, this grid served as an on-going reminder of the importance of these competencies and their relevance to personal and professional growth as physical therapist assistant.

This template structure enabled students to keep track of their academic progress through the span of

Figure 7
The Competency Grid of the Physical Therapist Assistant Program

multiple semesters and be reminded of the academic mission and the personal goal. Its folio thinking approach encouraged students not only to develop an end product that showcased their achievement but also to reflect on the process of learning. Students were asked to present an artifact from a given course, describe the nature of the course, and articulate its relevance to the educational and professional core values. This was achieved via the course reflection link to each of the artifacts presented.

Second ePortfolio Pilot

It took nearly a year for the PTA program to develop the new template. The use of this program-specific template marked the beginning of the second ePortfolio pilot from Fall 2010 to Fall 2011. Another three cohorts of PTA students participated in building their ePortfolio based on this programmatic platform. With the increased demand of the ePortfolio development, the PTA program realized that a more substantial and sustainable support system must be in place to assist both students and faculty. In order to enhance student participation and buy-in, the PTA program used another major college-wide pedagogical movement, the Capstone initiative.

Capstone initiative. The Capstone course was the ideal point for this ePortfolio engagement. As the last clinical course before internship, students had the opportunity to integrate and reflect on all of their learning experiences. This course had a weekly ePortfolio "Studio Hour," funded by the college. During this hour, an "ePortfolio Consultant," a trained fellow student or recent graduate with advanced knowledge of web page construction, helped PTA students with their ePortfolio. A LaGuardia study shows that the Studio Hour, "where students have most intensive and sustained exposure to ePortfolio consultants," enhances the learning outcomes of the ePortfolio (Acario, Eynon, & Lucca, 2011, p. 211).

Lastly, to take advantage of the ePortfolio's richness of information and its flexibility in presentation, the PTA program encouraged students to use the ePortfolio to make connections with their life outside of academia and to take pride in showcasing their unique personal and professional growth to a wide audience. In order to facilitate this goal more explicitly, an End-of-Program ePortfolio Showcase was instituted as a graduation requirement. Scheduled at the end of the last semester prior to graduation, all PTA graduates presented their ePortfolio to their peers and faculty as a

vehicle to share their reflection on how their life experience led them to a career in health care and how this PTA educational journey helped them realize this goal. At the onset of their clinical studies, all PTA students were made aware of this graduation requirement and were routinely reminded of this learning process in the Capstone course and internship. To ensure the quality of these presentations, both faculty and peers used an oral communication assessment rubric (Figure 8) and a PTA program-specific ePortfolio assessment rubric (Figure 9) to evaluate the showcase presentations and the ePortfolios.

Improvements of the Second Pilot

The data collected in this second pilot demonstrated key improvements over the first pilot. The use of the same grading rubric in a ten-point scale to evaluate the second pilot ePortfolios yielded the following results: the combined average ePortfolio scores went from 4.9 to over nine; the percentages of passing ePortfolios also improved significantly from 30% to over 90% (compare the first and second pilots in Figures 2 and 3). The improvements of the second pilot were due to the clarity and uniformity of the program-specific ePortfolio template, which made it easier for students to follow and keep track of their learning progress. Furthermore, the second pilot took advantage of the ePortfolio Consultant who mentored and supported students during their ePortfolio construction.

More reflective ePortfolios. Compared with those of the first pilot, the ePortfolios of the second pilot showed some improvements in helping students become more reflective of their learning process. Among the exemplars was the ePortfolio of the student D.T., whose final reflection articulated her experience in building her ePortfolio:

Looking back at my work on my ePortfolio, I realized that my commitment and devotion to my study has paid off in the form of ePortfolio. Every single assignment I completed in my major as a PTA student has been downloaded in my ePortfolio. By creating a cumulative showcase of my growth and development, I am able to learn about my own strength and weakness. When explaining my own growth as a PTA student, I will encourage people to see my struggle as a foreign student with English as my second language. I have always struggled my whole student life trying to understand and follow the American educational system. As a student, I was able to learn new technology like using the ePortfolio to save and share my work with others. As a professional, I was able to make a PTA ePortfolio which I will be using for my career development. I really enjoyed creating "classes and projects" because this is where you download all your hard work, i.e., papers. The most challenging tasks were downloading pictures and giving credit to websites. It was a bit time-consuming. The professors, student technology mentors, or other kinds of resources were very helpful in supporting my ePortfolio work. My classmates were very much impressed with my work. We all were very cooperative in helping one another to solve problems related to the ePortfolio. I feel that I am able to think and write more clearly as a result of my ePortfolio work. Creating the ePortfolio has helped me to improve my critical thinking, writing and communication skills. Practically, learning to use digital tools helped me to become a better student. It is very important for students to catch up with new technology. It is good to be a learner!

This student was able to reflect on how her struggle with English and the American culture as well as her academic challenges eventually contributed to the making of an ethical and competent healthcare provider. To demonstrate her fulfillment of the professional competencies, she described her internship experience at a nursing home where she was involved in the care of an injured elderly patient who had suffered from a fall. She drew connections between this experience with the clinical skills she had learned from one of her previous assignments and realized the positive impact of compassion during the patient's most vulnerable time. The ePortfolio in turn offered the student a means to collect her experiences, to make sense of the assignments and projects, and to connect her personal, academic and professional experiences.

Less weight to examination. Another major benefit resulting from the programmatic integration of the ePortfolio was the opportunity to offer faculty a means to adjust the relative weight of examination grades within each course. Before that, most clinical courses devoted 90-95% of the overall grade to multiple-choice and oral-practical examinations. With the newly developed program-specific template, the ePortfolio allowed faculty greater flexibility to reduce the heavy grading percentage of examinations and to pursue a more holistic way of assessing student learning. It also encouraged faculty to further refine their pedagogy to emphasize professional competency development in areas such as communication skills, research and technological literacy, and peer collaboration. In selected clinical courses, as much as 20% of the overall grade could be assigned to various assignments related to ePortfolio development.

Cross-disciplinary dialogues. As an example, a new assignment from the Therapeutic Procedures course was created in conjunction with the nursing

Figure 8
LaGuardia Community College's Speech Communication Assessment Rubric

Assessing Speech Performance Skills		Assessing Content and Structure of Oral Performance	Assessing Language Use
Vocal Delivery (Weight = 25%)	**Visual Cues (Weight = 25%)**	**Logic and Organization (Weight = 25%)**	**Language Choice and Pragmatics (Weight = 25%)**
•Competencies: •Appropriate fluency •Accurate pronunciation •With minimal use of verbal fillers • Effective vocal variation to convey meaning and emphasis •Appropriate rate and volume	Competencies: •Consistent eye contact •Appropriate posture, gestures and facial expression •Appropriate attire	Competencies: • Interesting, relevant topic •Clear, logical development of the main idea or thesis, inquiry or position •Consistent and adequate use of material, with citation when appropriate •Clear delineation of fact and/or opinion •In formal presentations, clear introduction, body and conclusion •Effective use of visual aids or technology when appropriate	Competencies: •Consistent use of Standard American English grammar •Appropriate level of formality •Use of vocabulary appropriate to the topic, audience and/or context •In prepared activities, use of creative expression and effective phrasing •In interactive events, clear evidence of effective listening and relevant responses •Responsiveness to audience and situation

program where groups of PTA and nursing students reviewed each other's ePortfolios and learned about each other's disciplines. In this activity, the ePortfolio functioned like a virtual contact zone between two professional teams who needed to understand each other's roles in the healthcare system. Through the study of artifacts found in each other's ePortfolios, both groups of students came to appreciate the subtle differences, as well as the many professional qualities shared by the two professions. It also encouraged them to describe how this knowledge enhanced their understanding of their own profession and promote collaborative relationships with other healthcare team members.

To illustrate this point, a level II PTA student J.L. from the class of 2012 wrote:

I've learned from this experience networking between physical therapist assistants and nurses is essential for the healthcare team to provide the best care possible for patients . . . this interaction will increase the efficiency of caring and rehabilitating patients, which is the most important aspect in both careers.

On the other hand, a nursing student learned from this PTA student's ePortfolio and commented:

PT and nursing go hand in hand. When a patient is receiving physical therapy, what can I do as a nurse to further build on what PT has already done to promote optimal healing? Personally, I am intrigued by the use of ultrasound treatment as described in your assignments. I want to learn more about the interactions between the healing effects of medication, acupuncture, and ultrasound for this type of injury?

These learning experiences generated by this cross-disciplinary ePortfolio assignment were richly interactive. The ePortfolio empowered students to dialogue and share their academic and professional growth in visible and meaningful ways. It was clear that such rich and lively peer exchanges could not be easily surfaced by teaching a curriculum based solely on standardized, high-stakes testing.

Integrative Learning Through the ePortfolio

This second pilot illustrated the flexibility and potential of the ePortfolio in terms of facilitating integration through the curriculum; it also served as a focal point for integrative learning across disciplines and among peers and faculty. Peacock, Murray, Scott,

Figure 9
Physical Therapist Assistant Program ePortfolio Assessment Rubric

PTA Student Professional ePortfolio Assessment Rubric
La Guardia Community College

Student Name: _____   Evaluator: _____   Date: _____

A Writing Mechanics (10%)	B Design (15%)	C Reflection (15%)	D Professionalism & Ethics (10%)	Content Completion (50%) -2pts. each	
Reflective Writing 2.5%_____	Use of Multimedia 3%_____	Description of achievement in each of the 12 clinical courses	(Same grading as My Professional Journey Project)	Mission Statement_____	Assign 9_____
Welcome Page 2.5%_____	Creativity 3%_____	12%_____	10%_____	Home page____	Assign10_____
Curriculum Vitae 2.5%_____	Visual Appeal 3%_____	Description of end of the Program reflection		Course1_____	Assign11_____
				Course 2_____	Assign12_____
	Organization of Content 3%_____			Course3_____	Assign13_____
Professionalism and Ethics 2.5%_____		3%_____		Assign 1_____	Assign14_____
				Assign 2_____	Assign15_____
	Appropriate use of Language & Images 3%_____			Assign 3_____	Assign16_____
				Assign 4_____	Assign17_____
(Evaluator's Comments)				Assign 5_____	Assign18_____
				Assign 6_____	Resume_____
				Assign 7_____	Related Links_____
				Assign 8_____	
Total_____	Total_____	Total_____	Total_____	Total_____	

For Sections **A B C and D** the following grading applies

Exemplary Work—	91-100%;
Very Good Work—	81-90%;
Average Work—	71-80%
Below Average work—	61-70%
Poor work —	< 60%

ePortfolio
Total
Grade

and Kelly (2011) from the United Kingdom reported similar findings:

[T]he wide range of tools within an ePortfolio provide mechanisms for our learners in creating, capturing, collating, and reflecting on feedback from a variety of learning experiences and a number of sources: peers, clinical educators, tutors, and self (process of learning). All types of feedback (visual, textual, and audio) may be held within the ePortfolio, collated, and then returned to by learners as and when required and used as a basis for reflection on competency and professional development. The opportunities for sharing could also support on-going dialogue with peers and supervisors (academic and placement) from wherever the learners may be physically located. (p. 35-36)

The program-wide implementation of the new PTA template improved both the quality and quantity of artifacts found in the ePortfolios. The template demonstrated its potential in helping students organize their work and facilitating reflective thinking and integrative learning. Students engaged in building and eventually presenting their ePortfolio had shown an

increased awareness of the connections between their academic, clinical, and personal development. However, despite a vastly improved ePortfolio experience with this second pilot, some issues remained.

The ePortfolio as an On-Going Pedagogical Challenge

Although the second ePortfolio pilot was rewarding for both students and faculty, this experience was not without its challenges. There were problems along the way that the program had to overcome in order to move the project forward. Even though the PTA Program was able to draw on LaGuardia's rich resources and support for ePortfolio development, its gestation period could not be hurried as each component, from the formation of the program-specific template to the alignment of appropriate assignments across the curriculum, placed significant demand on faculty and the college's technology system. Furthermore, faculty and student buy-in and faculty's professional development were elements that continued to challenge the implementation and sustainability of the ePortfolio.

In the case of facilitating faculty buy-in, it was a relatively small challenge to overcome as the PTA program had the distinct advantage of having a very small team of faculty (three full-time instructors and four adjuncts). Faculty members were committed to the adoption of new pedagogical approaches to promote student success. They explored the ePortfolio technology and pedagogy through a series of professional development workshops sponsored by the college. Bringing faculty members together, these workshops heightened their sense of collaboration and provided a collegial space where they could examine the connections between courses and how the courses could be further integrated into a programmatic curriculum that could balance test prep and professional development through the ePortfolio.

Although faculty devoted a significant amount of time to developing the ePortfolio template and integrating it across the curriculum, they could not compromise any individual course's effectiveness in preparing students for the NPTE. As a result, despite the promise of the ePortfolio for cultivating the whole student as a healthcare professional, faculty determined, with deep regret, that the outcome assessment of all clinical courses must remain examination-based. In other words, even after the program-wide integration of the PTA curriculum and the ePortfolio as a major teaching and learning tool, the status of the licensure examination has remained intact; the standardized multiple-choice test continues to be the dominant outcome assessment of both students and the program that teaches them.

For students as much as for faculty, the tension between standardized, high-stakes testing and the holistic development of PTA core competencies is still unresolved. Many students question how building a professional ePortfolio can help them pass a standardized test that determines whether or not they can practice as a PTA. Some argue how having an awareness of professionalism and ethics through an ongoing construction of their ePortfolio can contribute to, let alone guarantee, clinical and professional competencies. As mentioned, the ePortfolio cannot replace, or overshadow, the importance of a strenuous curriculum that gets students prepared for the NPTE and for safe, effective, and ethical practice. In this light, then, is the ePortfolio just another form of busy work, competing for students' limited time for academic study, hands-on practice, and internship?

Another concern was related to the competency grid of the PTA program. Even though students by and large completed the course and assignment grid in the clinical phase of their study, they often failed to do the same for the courses taken from the pre-clinical phase. The few artifacts provided by students to demonstrate pre-clinical academic growth bear little connection to their professional work done in the clinical phase. The goal of helping students integrate general education and professional competencies was significantly less apparent. The separation of the grid by the pre-clinical and clinical phases might partly be the blame. But is it fair to ask students to revisit general education courses and link them to their present PTA work retroactively?

For some students, the ePortfolio indeed helps them integrate their otherwise separate personal, academic, and professional lives and capture the meanings of their education. However, it is also true that many students' reflections remained shallow. Some of their reflective writings were descriptive, rather than analytical. These students were comfortable in showing where they originated and what they had done, but their narratives did not delve into the complexities, nuances, and intersections of their experiences and pursuits.

From the two pilots, the PTA faculty found that the ePortfolio could be counterproductive for some students. It can elevate the risk of over-taxing a group of students in an open admissions institution, students who are already severely challenged by their personal, socio-economic, linguistic, and educational disadvantages. For some of these students, simply completing all the course requirements, learning all the crucial clinical knowledge and skills, and ultimately passing the NPTE are their biggest obstacles to becoming a healthcare professional. Taking the extra time and effort to reflect on their educational life through the ePortfolio may very well be a luxury they cannot afford.

Conclusion

According to Shavelson, Klein, and Benjamin (2009), a standardized assessment should satisfy the following criteria:

> . . . (a) all students take the same or conceptually and statistically parallel measures; (b) all students take the measures under the same administrative conditions (such as on-site proctors and time limits); (c) the same evaluation methods, graders, and scoring criteria are applied consistently to all of the students' work; and (d) the score assigned to a student most likely reflects the quality of the work done by that student and that student alone (without assistance from others). (para. 5)

Meeting all of the above criteria, the 200 multiple-choice question NPTE is an objective assessment par excellence; it can measure students' academic knowledge at the end of their PTA training. Nevertheless, it does not assess their clinical skills and application of professionalism and code of ethics that are crucial to establishing safety and excellence in the clinic. As a common saying goes, "It is not what we know, but what we do that defines us." A student may, for instance, pick the right answer to a moral question related to a "real-world" case, but this does not necessarily mean that s/he can make sound judgments in resolving ethical dilemmas in a clinical setting. Nor does this demonstrate his/her active engagement in and continuous commitment to professionalism and ethics expected of all healthcare providers.

It is to compensate for such limitations of standardized testing that I hereby argue for using the ePortfolio as a complementary assessment of, and assessment for, learning in a healthcare program. The ePortfolio is actually much more than a means of assessment. It is a pedagogical tool that encourages students to look beyond their education as merely a test-prep workshop or job training. Despite their reluctance in reflecting on their education, the construction of the ePortfolio makes students confront the conflicts between examination preparation and continuous professional development and realize that there are core competencies and values that go beyond finding correct multiple-choice answers but are nonetheless equally important for the "health" of their profession and the health of patients.

My experience in integrating the ePortfolio in the PTA program points to several areas that call for improvement. The evaluative criteria of the ePortfolio, as well as the content and structure of the PTA program template, may be modified, or even simplified. Educational and professional competencies should be connected with course assignments in more explicit ways

so that students can deepen their reflection. Faculty should also provide on-going guidance and feedback throughout students' ePortfolio development, from the pre-clinical through the clinical phases of their training.

Currently, the use of the ePortfolio is a programmatic requirement for all PTA students at LaGuardia Community College. From the experience of building and completing their ePortfolio during their academic journey, PTA students are keeping a chronicle of their learning, sharing their academic and clinical experiences, reflecting on their education, and ultimately making meanings out of their professional training. Prior to graduation, as an evidence of completion of educational training, every PTA student presents their ePortfolio to a panel of faculty and peers. It is this vigorous and enriching ePortfolio experience along with a robust academic preparation for both the NPTE and clinical practice that has given the PTA program an opportunity to balance the summative and the formative assessments of student learning. It is in its struggle to balance both forces that the PTA program has used the ePortfolio as the complement to standardized testing and as part and parcel of a well-rounded healthcare professional program.

The PTA program's ePortfolio experience bears relevance to the national debates between ePortfolio and standardized testing advocates (e.g., Association of American Colleges and Universities, 2009; Schneider, 2009; Shavelson et al., 2009). The rhetoric of some of these debates seems to produce an impression that the ePortfolio and standardized assessment are antithetical. But from the PTA program's perspective, these two should not preclude each other as pedagogical and assessment tools. For in the profession of physical therapy, as in other healthcare professions, standardized assessments are a must: licensed physical therapists, nurses and doctors must meet uniform standards of their fields. Therefore, the PTA program has explored the ePortfolio not as a substitute for but as a complement to standardized testing in order to compensate for its shortcomings in teaching and assessment. The program believes that standardized testing and the ePortfolio can and should be combined strategically to inform a comprehensive professional education that aims to produce a knowledgeable and ethical healthcare workforce. We leave the implications of our findings to educators of other fields, assessment experts, and the higher-education community at large.

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Acknowledgements

Developing a Model for ePortfolio Design: A Studio Approach

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After developing and testing a model for integrative collaboration at Eastern Kentucky University's Noel Studio for Academic Creativity, we offer results that highlight the potential for peer review to significantly and positively impact the ePortfolio design process for students. The results of this classroom/studio collaboration suggest that students who participated in consultations at the Noel Studio were more successful in the design of their ePortfolios than students who did not. While the results have proven promising for sustained collaboration between the multiliteracy center and the ePortfolio course highlighted in this research report, the proposed collaborative model is highly replicable across many institutions.

This research report situates the ePortfolio within the context of a new, integrated space at Eastern Kentucky University (EKU): the Noel Studio for Academic Creativity. Within this new space, we have the unique opportunity to explore the ePortfolio as valuable in an integrative pedagogy that brings together students, professors, and Noel Studio staff for a hands-on learning experience. As a multiliteracy center, this space and mission appreciate the intersections and overlaps of research, writing, oral communication, and multimodal composition. Sheridan (2010) provided an introduction to the role of multiliteracy centers:

> A multiliteracy center can be both a part of the infrastructure that supports new media composing and a space where students critically reflect on and learn to exploit the infrastructural resources available to them. It can facilitate a professionally responsible approach to functional computer literacy. In short, it can be a site that welcomes the author as producer. (p. 81)

In this research report, the authors, comprised of the Noel Studio Director, Noel Studio Communication Coordinator, and education professor as co-designers of the collaboration outlined here, suggest that ePortfolios provide opportunities for students to integrate written, oral, visual, electronic, and nonverbal communication. Because previous research does not substantially address the role of peer review within the ePortfolio-design process, the research reported here serves as a starting point for future studies while shedding light on the potential for multiliteracy spaces like the Noel Studio to support the design of projects that require students to develop complex communication skills.

The Noel Studio opened in September 2010 as an integrated space dedicated to the development of effective communicators. As such, the space includes areas where students can project their visual or multimodal compositions, practice presentations using video equipment, or collaborate with group members in open spaces with writable walls and flexible seating.

The collaborative project detailed in this research report involves the Noel Studio working alongside education students and faculty from the Department of Curriculum and Instruction at EKU. The Noel Studio serves as a neutral space where these students can discuss multimodal components of their ePortfolios. At different stages of this process, students were prompted to design videos and slideshows that they would then add to their ePortfolio. In this research report, we overview a collaborative model for peer review piloted in the Noel Studio, which is replicable for other writing, communication, and multiliteracy centers.

The research discussed in this report serves as a catalyst for future collaboration. Perhaps most importantly, this article advocates for the multiliteracy center—in an integrative collaboration with faculty and students—as a productive space where students receive objective feedback on their ePortfolios. Peer review, in this case, serves as a platform for productive conversation that helps combine and isolate important rhetorical elements. Furthermore, the integrative nature of the 21st century learning space—the multiliteracy center—allows students to see how rhetorical conventions are repurposed or refashioned in ePortfolios. Through this research, we also attempt to address a gap in existing scholarship: the place of the multiliteracy center in the design process of ePortfolios.

Literature Review

While discussions of the importance of collaboration on the writing of ePortfolios abound, there is also a need for peer review of the design, layout, and organization of ePortfolios. For example, Zalatan (2001) discussed faculty coaching and technology training students received as part of the ePortfolio assignment; however, while faculty coached the writing in the ePortfolio and technology staff addressed the ability to create the digital document, there is no indication that design choices, organization, or peer evaluations were discussed as students modified the standard format offered to them in the class. And

while Peet et al. (2011) encouraged students "to seek feedback on the completed [ePortfolio] from a variety of people" (p. 17), there is also a need to obtain feedback during the design process. Moreover, even considering Arola's (2010) lament of web-design templates and the lack of design options to those who use such software, there is still "a rhetoric of the post" (p. 12), given that the pictures, colors, and layout of text still contain information that can work with, or against, the purposes of the ePortfolio composer. Those who do have full access to appropriate software or coding classes also have difficult design choices to make depending upon the purpose of their ePortfolios. These choices tend to be made not by rhetorical standards but by ability as students experiment more with design when they are more comfortable with the technology. While analyzing the ePortfolios of a class, Springfield (2001) found that "[t]he level of Web design ranged from very basic (those who just wanted something on-line) to overly complicated (those who wanted to try as much 'neat stuff' as possible) to exquisite (generally artists and computer science majors or enthusiasts)" (p. 56). While the level of technological savvy students acquire can help them shape more complex ePortfolios, there is still a need for a discussion about design choices, organization, and photo selections as they pertain to the ethos of the ePortfolio. Barrett (2001) said to

> [e]valuate the portfolio's effectiveness in light of its purpose and the assessment context. In an environment of continuous improvement, a portfolio should be viewed as an ongoing learning tool, and its effectiveness should be reviewed regularly to be sure that it meets the goals set. (p. 115)

We suggest consultations as a way to provide a more level playing field for students who come to class with a wide range of technical abilities.

Incorporating peer-review and group consultations in a studio, communication, or writing center atmosphere allows students to receive feedback from multiple sources without incorporating faculty time. This approach is how the Noel Studio answers the questions asked by Yancey (2001a):

> In some situations, faculty clearly will review electronic portfolios: during the class in the case of classroom portfolios, for example. But will portfolios be reviewed before they are submitted? Will others review them? Or will they be reviewed only once? . . . Faculty are likely to generate these kinds of questions, questions that need at least tentative answers before a plan is implemented. (p. 27)

And while faculty feedback is important, our research suggests that group, peer feedback led by a trained consultant greatly improved the overall scores of the finished product.

By incorporating ePortfolios in their consultations, writing and communication centers can begin to address the needs of the academic community as well as their students (Click & Magruder, 2004). Pemberton (2003) noted that although writing centers

> have been influenced by advances in computer technology . . . most of the interactions between students and tutors still center on the handwritten or printed texts that are placed on the table between them or, perhaps, shared in a word-processed file. (p. 9)

As college classes utilize more forms of communication in assignments (i.e., web-based portfolios and videos), the versatility to break out of the traditional structure outlined by Pemberton becomes imperative for writing centers. Indeed, Trimbur (2000) noted "writing centers will more and more define themselves as multiliteracy centers" (p. 29-30). The change from text-based to more visual-based forms of composition requires centers to take a careful look at the way in which a consultant discusses projects with students. Scholars have discussed the impact of multimodality on the 21st century writing center (e.g., Griffin, 2007; Sheridan, 2010) and the need to address multimodality in the classroom (e.g., Kress & van Leeuwen, 1996; Selfe, 2004), yet the best practices for conducting consultations involving these complex compositions remain largely under published. A notable exemption involved Clemson's Class of '41 Studio for Student Communication, which uses a rhetorical-based approach (Fishman, 2010); however, no rubric or list of questions for consultants to utilize during their sessions was provided. The rubric we adapted from Metros and Dehoney (2006) attempts to answer Yancey's (2001b) call to "think rhetorically . . . develop some key (well defined) terms that you can associate with your model of an ePortfolio, and use them consistently" while the peer review portion makes an effort to fulfill the call for a "collaborative process of development" (p. 87). As Yancey said, "students may be our best collaborators" (2001b, p. 87).

Dixon and Smith (2007) argued that productive interactivity with audiences who actively influence process, content, and outcomes displaces classroom hierarchies and the passive absorption of predetermined material. As we argue in this research report, objective peer-to-peer review outside of the classroom greatly enhances the ePortfolio design experience for students. During consultations, students discuss important topics

such as identity and ownership. The peer-review process allowed students to refine their identity as future teachers through their design decisions. As Dixon and Smith (2007) suggested, the meta-reflective process of crafting, rehearsing, and presenting an ePortfolio persona requires the student to project the self into a digital environment through representative words, visuals, media, links, etc., thereby necessitating a certain degree of self-estrangement. Goffman (1959) suggested the performative nature of presentations of the self. As Ramírez (2011) argued, electronic performance in ePortfolio design closely resembles live theatrical performance. The design choices made in ePortfolios create presentations of the self, each student's evolving online professional persona and part of his or her identity formation. Within the frames of the ePortfolio, the student's online persona and ethos as an educator are constantly redefined and reinscribed through the rhetorical decisions the student makes. As Dixon and Smith (2007) explained, personas are honed like characters for the new theatrical confessional box, where, like postmodern performance artists, individuals explore their autobiographies and enact intimate dialogues with their inner selves (p. 3-4). Reflecting, rehearsing, and presenting the self through the ePortfolio medium requires one distinctive element crucial to performance: audience. Our research seeks to understand the way peer review in a studio setting facilitates audience awareness of design choices among students made in ePortfolios by asking the following questions:

- What impact does collaboration with communication consultants have on the design of ePortfolios?
- Can a studio complement the work taking place in a classroom environment?
- How might peer review embrace the performative role of multimodal communication in ePortfolio design?

History and Justification for a Collaborative Model

The College of Education at EKU instituted portfolios in 1992 (Hyndman & Hyndman, 2005). The paper portfolio of the 1990s was standards-based, using the EKU Teacher Standards. During fall term 2000, EKU College of Education undergraduates began creating ePortfolios using FrontPage. By July of 2004, 1,600 EKU ePortfolios were online.

In 2008, in preparation for an upcoming National Council for Accreditation of Teacher Education (NCATE) visit, the college moved ePortfolio development into a commercial system, TaskStream. Beginning in fall 2009, EKU College of Education undergraduate students not only developed TaskStream

ePortfolios but were assessed through TaskStream. Initially, TaskStream ePortfolios were little more than their 2000 FrontPage counterparts, containing basic assignments with accompanying reflective statements and indications of EKU Teacher Standards covered by each assignment as marked by students.

From 2008 to present, professors in the foundation course in which students started their ePortfolios began to explore methods to help students better understand the reflective process and to write more advanced reflections to accompany assignments. Additionally, students were expected to provide a visual for each assignment page. Initially, the visual was clip art provided by TaskStream. Later, students created visuals using their own photography and art, which could be manipulated through programs such as PowerPoint and websites such as Picnik (http://www.picnik.com/). Instead of writing a letter to the reviewer of the portfolio, students were expected to create videos with programs such as Windows MovieMaker and websites such as Animoto (http://animoto.com/). These changes in visual expectations for students allowed for expressive visual and aural elements in ePortfolio development (FitzPatrick & Spiller, 2010).

Professors involved in ePortfolio development at EKU were pleased with the metamorphosis of the ePortfolio, ever challenging students to be more creative, introspective, and technologically adept. But faculty had hit a wall. They were teacher educators with basic technology skills. The 2010-11 academic year presented EKU teacher educators with the opportunity to collaborate with the new Noel Studio, an emerging multiliteracy center. In the paragraphs that follow, we offer an overview of the model employed within this collaboration between ePortfolio students and the Noel Studio. Interestingly, Peet et al. (2011) explained, "It is not yet clear, for example, what kinds of integrative learning experiences lead students to connect, integrate, and synthesize their learning, or how ePortfolios can be used to facilitate that process" (p. 11). The model and discussion that follow extend Peet et al.'s (2011) research, while attempting to place it into context within our own research.

A Studio Model for Integrative Learning with ePortfolios

Metros (2008) explained that students lack visual acuity. Students, as Metros argued, "dismiss imagery as mere decoration" (p. 105). We view this lack in visual literacy as problematic for ePortfolio designers and seek to develop students who understand the importance of evaluating visual information, especially in relation to writing and research. Responding to Metros, we attempt to help students "identify, understand, and critically analyze visual representations

in a larger context" (2008, p. 105). The model offered below presents one perspective on the integrative learning experiences from this collaboration within the Noel Studio, along with the pedagogical approach employed in each stage (see Figure 1). The authors argue that this integrative collaborative model had a major impact in the results suggested in this project and is replicable in a wide variety of institutional settings. Following is a description of each stage:

1. *Assignment*: In the initial stages of the ePortfolio design, the education professor instructed students to develop an introductory video with a target audience of parents, teachers, principals, and/or future students. The video would not be a representation of the student now but the teacher he/she is committed to developing. Creation of the video was a multi-layered process requiring technological skills as well as the initial development of a teacher identity.

2. *Noel Studio Visits Class*: The Noel Studio Director visited all 145 education students in the lecture space to provide an overview of the collaboration; services provided by the Noel Studio, best practices for consultations, and communication-design resources offered.

3. *Noel Studio Visits Groups*: The Noel Studio Director visited the same 145 students but in groups of 20 in the education technology lab space to provide an introduction to ePortfolios and to determine a sense for where students were in the invention process. Sessions focused on generating ideas and excitement for ePortfolios, especially the development of introductory videos, which would play an important role in conveying developing teacher identity.

4. *Groups Attend Noel Studio Orientation*: The Noel Studio Director, along with the education professor, assembled each group—approximately 20 students—in the Noel Studio, a collaborative and technology-rich space located in the Crabbe Library. Orientations focused on rhetorical and design elements involved in ePortfolios and drew from Williams' (1994) CRAP principles from the *Non-Designers Design Book*, Gestalt principles as outlined by Horn (1998) in *Visual Language*, and cognate strategies as outlined by Kostelnick and Roberts (1997) in *Designing Visual Language*. These orientations also allowed students to discuss their ideas for ePortfolio design in small groups, paralleling the training received by consultants in step five

and the design of the consultations in steps six and seven.

5. *Train Noel Studio Consultants*: The Noel Studio team, in collaboration with the course professor, facilitated training for consultants that focused on elements of design, group dynamics, and digital presentation and ethos. ePortfolio trainings consisted of four one-hour sessions during the first four weeks of the semester and focused on exploring the ePortfolio system, TaskStream, rhetorical conventions for discussing ePortfolio elements, effective design strategies, and specific training in small-group communication and group dynamics.

6. *Video Consultation Small Groups*: Students visited the Noel Studio in small groups of four or five and met with a consultant to discuss options for video organization and design. These consultations focused specifically on videos that would later become components of the ePortfolio. Consultants encouraged students to present ideas to each other while offering objective feedback.

7. *ePortfolio Consultation Small Groups*: Students visited the Noel Studio four weeks later again in small groups with completed drafts of their ePortfolios. The second consultation for ePortfolio students focused on the ePortfolio as a piece of multimodal communication. Again in small groups of four or five, consultants and students discussed how visual and verbal intersect and complement one another, audience, and technological sophistication. Rhetorical elements were also key to the second small-group consultation, as students were refining their educator personae through multiple modes.

8. *Researchers Evaluate ePortfolios:* At the conclusion of the pilot, the researchers—including the Noel Studio Director, Noel Studio Communication Coordinator, and education professor—began meeting weekly to evaluate data, including the ePortfolios, consultant surveys, and consultation videos. The researchers calibrated their scores, according to the rubric (see Figure 2), which was adapted from Metros and Dehoney (2006), provided to students and consultants, and engaged in multiple group scoring sessions.

As outlined above, we argue that a number of characteristics available in this collaborative model

Figure 1
Model of Noel Studio Integrative Collaboration
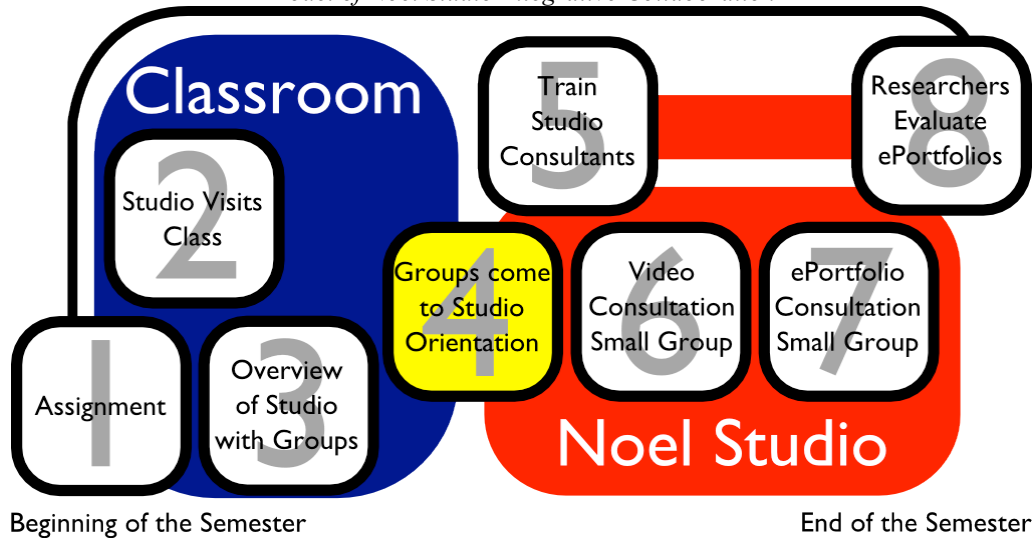
Figure 2
Adapted Noel Studio Rubric

Noel Studio ePortfolio Rubric

Dimension	Beginning	Developing	Prepared	Comments
Concept Originality Ability to define problems, explore various possibilities, and develop unique solutions.	Provides little or no evidence of new thought, inventiveness or creativity.	Concept supports design task; demonstrates some new thought, inventiveness or creativity.	Concept effectively addresses the design task; extends others' approaches in inventive ways; may show significant evidence of originality and inventiveness.	
Aesthetic Quality Sensitivity to the principles of design and successful fulfillment of project criteria.	Visuals are either too simplistic or cluttered and busy. Graphic effects fail to support the message and hamper communication of content; graphics are gratuitous. Concept fails to support design task.	Visual elements relate to content. Visual design criteria (balance, contrast, proportion, harmony, etc.) expressed. Graphical elements reinforce content and are functional.	Skillful handling of design elements creates unique and effective style. Visual elements and content reinforce each other. Design strategy supports message. Overall, an effective and functionally sound design.	
Digital Presentation Display of technical skill, ability to follow directions, craftsmanship.	Poor craftsmanship given available technologies. For multimedia, no attempt to manipulate timing, flow, transitions, for effect. Production errors not addressed. Project fails to address assignment criteria.	Acceptable craftsmanship. No obvious easily correctable errors. For multi-media projects, elementary efforts to control timing, flow, transitions. Project fulfills assignment criteria.	Clear effort to achieve high production values and to use production techniques to enhance product. Craftsmanship or presentation may approach professional quality. Project goes beyond assignment criteria.	
Writing Display of writing skill through grammar, diction, and structure as it relates to audience and purpose.	Multiple instances of inappropriate grammar and word choice considering the audience; arrangement of ideas is illogical and lacks a clear purpose.	Word choice and sentence structure basic but effective for the audience; arrangement of ideas is inconsistent in logic and purpose. Mistakes in grammar do not interfere with content.	Word choice, sentence structure, and grammar are appropriate to the topic and audience. Ideas are logically arranged and demonstrate a clear purpose.	
Formatting Sensitivity to the audience reading the text on the screen.	Text is difficult to read on the screen due to size and/or color choice; no usage of space or paragraphs.	Text is legible most of the time; some usage of space or paragraphs to make the text more accessible for the reader.	Text is easy to see and read; text is divided into easily scanned sections; section heads and subheads provide easy access.	
Sources/Citations Authors may need to correctly cite sources.	One or more resources not cited; multiple citation errors.	All resources cited; some citation errors or formatting inconsistencies.	Resources well researched and thoroughly and correctly cited.	
Accessibility All projects should be authored in accordance with W3C or campus accessibility guidelines.	Not accessible and no consideration of accessibility concerns.	Errors and inconsistencies in labeling; fully annotated but technical difficulties (for example, displaying alt text).	Product is completely compliant according to universal design standards, the law, and your campus guidelines and policies.	

Rubric adapted from Metros, S. E., & Dehoney, J. (2006). *Communicating visually: New fluencies for the academic community conference workshop.* San Diego, CA:

EDUCAUSE Learning Initiative.

contributed to its richness and potential for success. First, students were able to see ePortfolio design as a process through the collection of a variety of educational experiences communicated in multiple modes: written, visual, oral, and multimodal experiences. Moreover, the process-oriented nature of the ePortfolio collaboration encouraged students to collect and communicate a range of experiences, which encouraged a depth of context in the ePortfolios beyond the use of images that are merely aesthetically pleasing in favor of images that were rhetorically effective. The process encouraged students to delay evaluation of the ePortfolios until the components were in place to view it as the sum of its component parts. With an emphasis on collaboration and process, the teaching spaces involved in the project became student-centered. Control shifted to the students engaged in ongoing design. The collaboration encouraged students to grow over the course of the semester gradually and incrementally through several contacts with the Noel Studio during the semester, especially in the early weeks, rather than attempting to learn effective design techniques at the end of the semester when such strategies could no longer be implemented in the final product. The approach, as described above, echoes Hamp-Lyons and Condon's (2000) earlier work on portfolio assessment when they explained that

> [p]ortfolio-based assessment, with its combination of performance assessment and delayed evaluation, gives learners the means of assuming responsibility for their learning, lets teachers become genuine mentors for learners, and creates a time period, a space, within which learning takes place. (p. 100)

Furthermore, the collaborative model outlined here extends Kimball's (2002) process: "To ensure that your web portfolio is as polished as possible, regularly go back and assess how your finished product compares to the standards by which it will be judged—then work to make the two match" (p. 129). In the pages that follow, we discuss our approach to assessing ePortfolios and reflect on our observations.

Method

Our participants include undergraduate sophomore and junior students enrolled in the EDF 203 course in the Curriculum and Instruction department within the College of Education at EKU taught by Dr. June Hyndman. All 145 students are education majors in varying tracks, but all students designed the ePortfolio with the intention to communicate an educational ethos to potential employers. While all students participated in steps one through four in the model above (see Figure 1), some students visited the Noel Studio twice,

once during the first half of the semester during the invention stages and once during the second half of the semester during the final revision process to discuss elements of their ePortfolios, including videos, static images, text, and sound. Other students chose not to use the Noel Studio during their ePortfolio and video development.

Evaluators reviewed and discussed five ePortfolio samples from a previous semester as part of the norming process, calibrating each category of the rubric. At the conclusion of the study, eight students were randomly selected from the nineteen of those who came to the Noel Studio twice and eight students were selected from the twenty-nine who did not use the Noel Studio at all. The ePortfolios were evaluated based on the rubric provided to the students and Noel Studio consultants—discussed in detail below (see Figure 2). The rubric uses seven dimensions: concept originality, aesthetic quality, digital presentation, writing, formatting, sources/citations, and accessibility. The researchers viewed the ePortfolios together via a large screen but kept their evaluations private until the end of the evaluation process. ePortfolios created without collaboration in the Noel Studio and those created with collaboration in the Noel Studio were shown randomly with researchers not knowing which group each ePortfolio was in. Additionally, researchers scored independently and scores were averaged afterward. Evaluators' ratings of the ePortfolios were found to have an acceptable inter-rater reliability (average measures ICC = .90).

Limitations

One limitation of this study is self-selection bias. Students either took advantage of the Noel Studio consultations or they chose not to visit. It is acknowledged that students who visited for feedback may be more conscientious communicators and their ePortfolios would be of higher quality. However, one could also argue that many students who use the Noel Studio experience communication anxiety and thus use the additional feedback to build confidence in their communication products. We suggest that the results of this pilot study are more indicative of the classroom-Noel Studio relationship because students volunteered to visit for consultations.

Results

The average rating for those participating in two Noel Studio consultations (M = 133.2) was found to be significantly higher than those who did not participate in a Noel Studio consultation (M = 32.3; t(14) = 2.24, p < .05). As the research suggests, students who collaborated with their peer group and consultants in

the Noel Studio scored 25% higher using the rubric than those who did not collaborate. The rubric (see Figure 2) served as the basis for conversations between students and consultants.

Discussion and Implications

While the results suggest value in the Noel Studio-classroom collaboration in the design of ePortfolios, the study identifies valuable areas for reflection as well. In addition to the results of the quantitative study, the authors offer perspective on both the Noel Studio and classroom sides that should guide the design of future collaborations.

Noel Studio Reflection from the Study

Barab, Barnett, and Squire (2002) stated that students' portfolios serve five critical functions: evidence of teacher readiness; evidence of teacher potential; a model of best assessment practices; an opportunity for reflection on areas of strength and growth required; and a vehicle for personal and professional growth. The students who scored the highest according to the rubric used in this study had a highly original concept—often a theme that communicated their ethos as teachers—carried throughout the ePortfolio. The two most successful ePortfolios included visual elements that created energy around teaching. Students communicated who they are as teachers through static images and video. Importantly, though, they employed themes such as hands-on learning, creativity, and the use of technology to help viewers envision them as future teachers. Students who scored highly wrote concisely for web readers. They also conveyed clear audience awareness through word choice, sentence length, tone, and consistent formatting.

Students who visited the Noel Studio twice exhibited strong information literacy skills, using full documentation with visuals, quotes, and videos. These students researched resources thoroughly and cited them correctly. The rubric facilitated a rather complex conversation about the rhetorical nature of visuals and design decisions in general. Consultants were not education majors, and students were not graphic designers accustomed to composing texts in electronic environments. While the training involved in this collaboration certainly informed students' feedback, this process has also impacted positively how ePortfolio design will be taught from the professor's perspective, encouraging the College of Education to engage the rhetorically significant appeal that multiliteracy scholars call "ethos" (Carpenter & Apostel, 2012) and educators call "teacher identity" (Shulman, 1998).

The early success of the research project and collaborative relationship fostered by integrating the Noel Studio into the EDF 203 ePortfolio-design process is suggestive of the potential for peer-to-peer feedback traditionally reserved for print-based texts to also enhance students' ability to make rhetorically effective design decisions that integrate written, oral, visual, nonverbal, electronic, and aural communication elements in ways that show an understanding of how these areas interact and complement one another. Rather than making decisions for purely aesthetic reasons, or based on convenience, consultations in the Noel Studio created a supportive physical and intellectual space where students, consultants, and at times the professor met to collaborate and discuss strengths and shortcomings of their design process. We began the collaborative process understanding the value added by objective peer-to-peer student feedback on written communication products. However, we also realized that there was similar potential for peer-to-peer feedback on texts that are not produced on the printed page. This move would prove valuable as the Noel Studio grew into its space and role on campus, while serving a committed role by providing a space where students could receive feedback on their ePortfolios where no feedback outside of class was available before. Consultations provided students with the opportunity to explore the performative nature of ePortfolios, including the design process. That is, they began to isolate and combine communication modes while seeing their work as necessarily rhetorical and the enhanced or diminished ethos as a critical piece of their consultations. While the feedback received in class was valuable, there were not opportunities for students to explore or express in any in-depth way the rhetorical nature of their design decisions, whereas in the Noel Studio consultants are trained and prepared to discuss these elements with students.

Teacher Educator Reflection from the Study

Shulman (1998) likened teaching to dry ice at room temperature. It evaporates and leaves no visible trace. This study reveals that ePortfolios can make explicit the preconceived notions of identity as a teacher and promote the re-examination of underlying beliefs and values in light of practical experience and reflection, and thus serve as bases for change and improvement. As Mitchell et al. (2010) argued, the ePortfolio research process is cross-disciplinary. The integrative collaboration discussed in this research report is also necessarily cross-disciplinary. Thus, it was important to ground consultations at least initially as a starting point for both sides. The rubric used in this study served as the basis for conversations between students and consultants. The rubric, in this case, facilitated a rather

complex conversation about the rhetorical nature of visuals and design decisions in general. While the training involved in this collaboration certainly informed students' feedback, this process has also impacted positively how ePortfolio design will be taught from the professor's perspective.

Collaboration with the Noel Studio illuminated pedagogical possibilities for instruction in the classroom far beyond and more in depth than technological literacy with the ePortfolio system. Foremost, the collaboration highlighted the need for students to receive additional feedback and guidance on text alignment, consistency, and contrast. Furthermore, the orientations held within the Noel Studio during the early stages of the collaboration foregrounded the need for students to think critically and creatively about how they integrate color, photographs, and illustrations into their ePortfolios and how these choices had significant implications about how potential employers would perceive them as emerging professionals and teachers.

Conclusion

Although this collaboration involves students in education, the model described here is replicable across the disciplines. More specifically, this model outlines a process whereby ePortfolio students receive feedback and interact in multiple settings intended to promote conversation from the initial stages of their invention process to video development and then toward analysis of the entire ePortfolio and its components. One of the primary goals of this collaboration is to develop multiliteracy skills in ePortfolio students, providing them with feedback throughout the process that will guide them in the future. Through this process, students are better able to articulate elements of their portfolios and sufficiently prepared to integrate compelling written, oral, visual, electronic, and aural elements into their ePortfolios. This development extends beyond the completion of the ePortfolio or degree program. Students see a process emerge that was not as apparent beforehand. As ePortfolio designers, students benefit from a more refined process, as they are better able to assemble components and articulate objectives for their own projects as they begin envisioning their place in the professional world—in this case as educators in the classroom. Through ePortfolios, students have the opportunity to employ a grammar of visuals, as Kress and van Leeuwen (1996) suggested, to convey a professional ethos. This opportunity is unlike that of traditional research papers or interviews alone. In the design of ePortfolios, multiple modes come together to form a more powerful communication product. The multiliteracy center is the ideal home for these projects, one that complements the classroom and provides

unparalleled potential for complementary feedback that extends instruction provided by the course instructor.

ePortfolios provide the ideal context for discussions about multimodal communication and the rhetorical nature of these texts. The integration of time for students to reflect critically on their practices in a supportive, collaborative space like the Noel Studio increases opportunities for students to receive focused, quality, and objective feedback from students outside of the classroom. The feedback, in turn, informs teaching practices in the classroom, also providing the professor with the chance to reflect on current practices for ePortfolio design. However, since reflection is not a goal in itself, but is rather intended to stimulate teachers to change and improve, further research should focus on examples of how the reflective process has changed various aspects of their teaching.

Students, in their consultations, reflected on design choices employed in their ePortfolio. Consultations focused on reflective practices that took students outside of the context of the course and consultation and required that they put themselves in the role of the teacher. Thus, students gained strategies for ePortfolio design that will benefit them long after they leave this course. As part of the reflection process, we learned that while the design of the rubric used in consultations and for evaluating ePortfolios generated useful feedback and productive conversation, future iterations could be more streamlined as a quick reference as consultants become more versed in these categories and training is developed. By distilling the content in each category, the rubric could be more portable and manageable for use in consultations. Future training for consultants should include an increased emphasis on visual literacy and multimodal communication.

As a result of our experience integrating the Noel Studio into the ePortfolio process within the curriculum of a foundational education course, we foresee implementation of similar models in a wide variety of settings and campuses. We recommend implementing ePortfolios as part of an integrated assessment system by

- starting simple, collaborating with communication consultants trained in written, oral, visual, electronic, and group communication;
- building upon work completed in the classroom environment; and
- embracing the performative role of multimodal communication in ePortfolio design.

As this experience suggests, there is great potential for consultations to enhance the design process for ePortfolio students. We began with a visionary

collaboration and have developed a model that will allow the two areas to complement and extend one another with EKU staff, faculty, and students learning side-by-side with one another.

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The Dialogic Potential of ePortfolios: Formative Feedback and Communities of Learning Within a Personal Learning Environment

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This paper reports on the findings of a study into the use of ePortfolios as personal learning environments (PLE) by a group of students pursuing Master's degrees in Education. The qualitative study explores the potential of the ePortfolio to support learners in engaging in formative peer and tutor feedback as well as in developing a learning community. Within this study, the ePortfolio is presented as an alternative to the discussion forums based in the institutional virtual learning environment (VLE), as it combines the individual, reflective benefits of the PLE with the communal, social benefits offered via the discussion forums. Data were collected of the interactional content that students created through the ePortfolio (blog posts and responses to others' posts) as well as through a focus group interview with the participating students that explored the learners' perceptions of the ePortfolio as a support mechanism for their study on a specific module. The findings of the study indicate that while in many ways learners' online interactions through the ePortfolio were similar to those described in VLE discussion forums, there were several key advantages to positioning this dialogue within a PLE, including encouraging deep rather than surface approaches to learning and providing the opportunity to construct a personal and re-traceable narrative of the individual's learning journey.

This paper reports on the findings of an action research study exploring the potential benefits of using an ePortfolio tool as a support mechanism for teaching and learning in a Master's program in Education. It is argued that the ePortfolio tool introduces essential affordances for student learning that are not as readily available through an institutional virtual learning environment (VLE) discussion forum. The paper takes the perspective that a learner-centered approach using continuous dialogue is necessary to support learners studying in blended format courses (i.e., those courses that implement both face-to-face and fully online components). In addition, the need for the learning environment to contribute to the development of a community of practice is discussed.

The action research methodology of the study is discussed, which focuses on analyzing the interactional content which learners have produced within the ePortfolio in the process of giving and receiving formative feedback from peer and tutor and reflecting on their academic practice. The findings of the study discuss the ePortfolio as a personal learning environment (PLE), which allows the learner to develop a reflective narrative of his or her learning journey. The benefits of developing such a narrative are seen as encouraging a deep approach to learning and as supporting the essential processes of reflection in action. The principles of successful online community building as outlined by Preece (2000) and Salmon (2011) are examined in the context of the ePortfolio. An exploration of the literature has led to a better understanding of where the differences are in terms of organizing support for community building and formative feedback for learners working within a PLE context.

Literature Review

Contemporary teaching and learning practices increasingly involve e-learning environments alongside traditional face-to-face delivery. Given the increasing use of technology in learning and teaching, it is imperative for educators to consider carefully with what purpose technology is being used in teaching practice and with what benefit to the learner. The effects of the technological push (Collis & Moonen, 2001) have to be minimized in order to give way to the careful planning of teaching and learning with a primary consideration for the learner's needs. Current thinking in this area has shown that the use of technology does not automatically lead to better learning or improved understanding; rather, recent studies suggest that the use of information and communication technologies in a pedagogical context emphasize the need for more human contact as an integral part of the teaching and learning process (Njenga & Fourie, 2010). This perspective necessitates a careful consideration of blended learning approaches (Littlejohn & Pegler, 2007), which combine the valuable aspects of face-to-face interaction with those of online interaction in an attempt to more fully meet the needs of learners. Authors and practitioners now discuss the pedagogical dimensions of e-learning and blended learning with relationship to the learner's experience and the learner's needs (Jones & Lea, 2008; Laurillard, 2002; Matusov, Hayes, & Pluta, 2005). This further highlights the value of peer support and interaction as well as the need to consider the holistic learning community with which the learner interacts throughout his or her academic practice. A move towards a learner-centered approach, based on continuous dialogue between learner, peers, tutor, and

the broader community of practice is necessary. The learning environments within which these interactions take place must be flexible, learner-centered, and allow for dialogic interaction in order to fully support the learner.

Learner-Centered Pedagogy and Learner-Centered Tools

Effective use of e-learning technology requires an underlying pedagogical approach, which is ideally learner-centered and allows for a continuous dialogue to evolve between learner and tutor (Laurillard, 2002). Such learner-centered approaches emerge from social constructivist pedagogy, articulated by Vygotsky (1978) as the idea that dialogue, guidance, feedback, and social interactions are drivers for transforming potential development into actual ability. Lave and Wenger (1991) developed this concept further to identify that socially supported learning happens in communities of practice; learning is seen not as a single act of internalization but as "trajectories of participation" (p. 89) where progress in learning is evaluated through the changing roles that the individual acquires within the learning process.

The benefits of a social constructivist approach and the value of communities of practice have seen development within current learning and teaching practice through the use of discussion forums and in an institutional context within virtual learning environments (VLEs). Concurrently, web 2.0 technologies have made available a host of learning tools that afford a deeper level of personalization than that offered by VLEs (Brown, 2010). The ePortfolio in particular can be identified as one such personal learning environment (PLE). Initially emerging as a tool for supporting "personal development planning" (Grant, Rees-Jones, & Ward, 2004), the ePortfolio has become established as a broader mechanism for reflection, communication, and planning. The Higher Education Academy (2012) defines personal development planning as "a structured and supported process undertaken by an individual to reflect upon their own learning, performance and/or achievement and to plan for their personal, educational and career development" (para. 1). This definition places an emphasis on learning as a personal journey. In this context the ePortfolio responds to the institutional need to offer a personal learning space to all learners, as expressed in the Department for Education and Skills e-Strategy (DFES; as cited in Ward & Richardson, 2005, p. 2).

Increasingly, the ePortfolio is also seen as a mechanism for sharing, communication, assessment, and feedback (JISC, 2008). The Joint Information Systems Committee (JISC; 2008) articulates the benefits of the ePortfolio both as a mechanism for developing an understanding of complex ideas and concepts and as a tool for socializing within a community of practice (p. 9). Stefani, Mason, and Pegler (2007) articulate the potential of the ePortfolio precisely as a tool for formative assessment and feedback, stating that if the portfolio use was presented to students as a way to carry out structured activities, learners would be able to use the tool to develop thinking skills and receive useful feedback in the process (Stefani et al., 2007). The benefits of a social constructivist approach to learning and communities of learning are therefore primarily a matter of effective academic practice. On the basis of the constructivist theoretical perspective (Vygotsky, 1978), it can also be argued that the capacity to implement a learner-centered approach through the ePortfolio is partly defined by its dialogic potential.

In the context of academic practice, the ePortfolio's dialogic potential can be judged according to the nature of the dialogue and feedback that develop, whether learners are encouraged to participate, and whether this participation is meaningful and leads to knowledge construction. This makes it necessary to further consider the dialogic potential of learning environments.

Dialogic Potential and Community Building

Dialogic potential and community building are attributes that have long been associated with virtual learning environments (VLEs; Preece, 2000). Knowledge of the principles of online community building and constructive dialogue online is essential in order to be able to provide a meaningful learning experience. One of the most useful frameworks for understanding how to successfully scaffold support for online learners is Salmon's (2011) five-stage model for collaborative online learning (see Figure 1). The model provides guidance on how to support learners' dialogic and community building interactions online throughout the different stages in their learning journey. Salmon identifies five stages in the process of online participation, with each stage representing a different level at which the interactions and learning gradually evolve towards deeper and more meaningful forms of learning. An essential aspect emphasized in the model is the tutor's changing role as an e-moderator, from initiating the interactions in the first few stages of the model, through gradually becoming a facilitator for the learning interactions. Concurrently, the learner's role changes towards a progressively more active and constructive one. Salmon emphasizes that the success of the online interactions in terms of potential for learning depends strongly on this gradual scaffolding of the support, which the e-moderator provides. The

Figure 1
Salmon's (2011) Five-Stage Model for Collaborative Online Learning
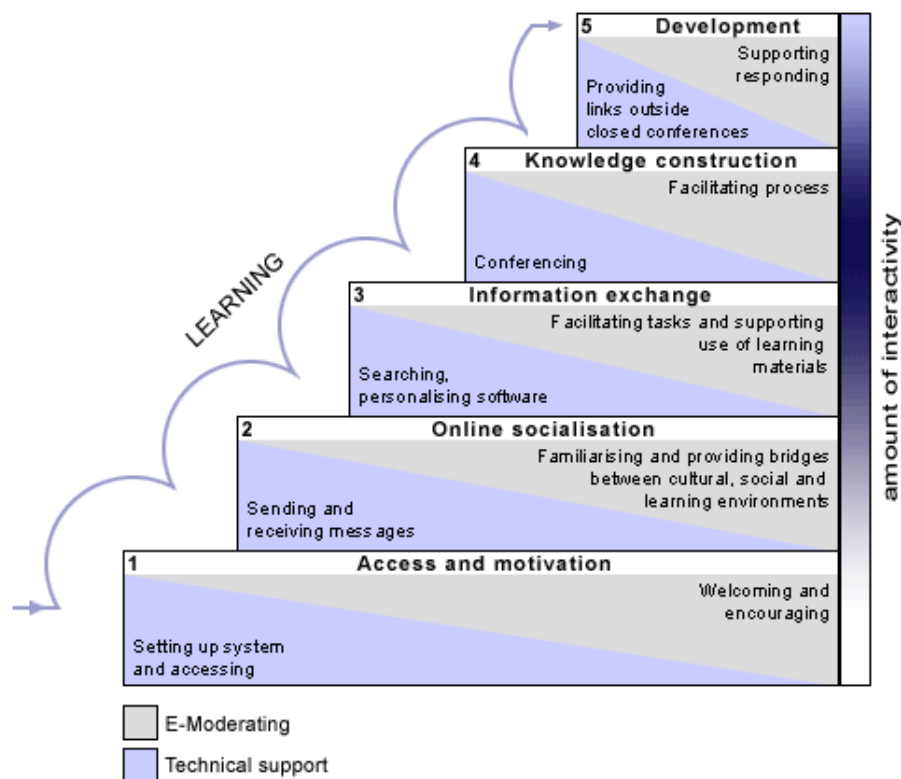
(Salmon, 2004, para. 2)

author further states that the early stages of motivating learners to socialize online are essential in order to gain the benefits of active learning and knowledge construction in the later stages of interaction (stages three to five).

Similarly, Preece (2000) identifies several core attributes of successful online communities. These attributes include shared goals, access to shared resources, engagement in providing continuous support for each other and the use of shared policies (Preece, 2000). Like Salmon (2011), Preece (2000) also conceptualizes community as a "process" (p. 26), which helps to emphasize the essential aspect of students' engagement over time and their motivation for engagement.

Other current studies on understanding community building in online forums have focused on the roles that learners adopt and the nature of the discussions in which learners tend to engage. A study by Jones and Lea (2008) indicates that in their use of discussion forums, learners adopt interchangeable roles of "supportive fellow student, as a learner in need of help, as a friend, as a person who temporarily takes the role of teacher" (p. 211). The evidence in this study suggests

that learners benefit from such interaction both ways: by providing advice to others and by receiving feedback from peers. Similarly, Preece (2000) highlights that the socialization principle within an online community requires participants to adopt different roles: "moderators and mediators . . . professional commentators . . . provocateurs who provoke, general participants who contribute to discussions; and lurkers who silently observe" (p. 83). Such role taking contributes to better participation and a stronger community.

The nature of the discussions in which learners engage has been another focus of current research, providing an insight into what motivates learners to contribute to online communities. In their study on using discussion webs to develop communities of practice, Matusov et al. (2005) developed an ontology of conversation topics. Such topics included off-subject discussions and life experiences, which collectively served a variety of purposes including encouragement, social acknowledgement, and socialization. This aspect of online participation suggests that there is a need to afford opportunities for less formal socialization in order for a community of learners to develop. This type

of engagement is further recognized in Salmon's (2011) five-stage model, which outlines that—particularly at the earlier stages of online discussion (stage two of the five-stage model, see Figure 1)—the emphasis is on socialization within the forum. This is an essential stage when the tutor as e-moderator should encourage social exchanges that build mutual trust and respect and promote the development of a community.

There are some significant differences in the way socialization and dialogue take place depending on the learning environment. It is evident, for example, that learners' motivation for participating in online community building is dependent on careful scaffolding of the learning interactions and the provision of a strong focus for the discussions (Preece, 2000; Salmon, 2011). Much of this preparatory work is the responsibility of the tutor; this locus of responsibility is contradictory to the learner-centered model inherent in PLEs such as the ePortfolio. This suggests that while Salmon's (2011) five-stage model provides a useful framework for supporting learning interactions within a VLE-based community, using a personal learning environment such as the ePortfolio necessitates a different perspective. One key difference is that within a personal learning space, learners need to take ownership of the process from the very start of their interaction within and through the ePortfolio; this is contradictory to Salmon's (2011) model, which outlines ownership as the final stage of her model of engagement in online communities. This element of ownership and learner control of the online interactions is central in the design of PLEs and should be seen as an essential requirement for their effective use. The ePortfolio as an example of a PLE offers the learner a choice of which parts of his or her academic practice to share with others and thus provides the learner with increased control. Any dialogic interaction is centered on a topic generated by the learner and depends on the learner's confidence, ability, and motivation to initiate useful discussion. These dependencies raise the question of what the motivating factors are for sharing and initiating discussion when doing so is entirely the learner's choice.

Further questions emerge where an ePortfolio is introduced as a mechanism for formative feedback and community building: When an ePortfolio is used to facilitate idea exchange and feedback, to support information sharing, and to build a community of learners, how should it be organized and supported? Do the principles of successful online community-building outlined by Preece (2000) and Salmon (2011) apply where a PLE such as the ePortfolio is concerned, or is a different approach required where control, initiative, and ownership are central? Does the requirement to have a high level of personalization and ownership from the start pose issues for learners who are less experienced in online communities and interactions?

Study Design and Methodology

The methodological approach used for the present study involved a small scale, qualitative action research approach, focused on the context of a blended learning Master's level course in Education Innovation and Enterprise. The Master's program includes an e-learning module that is delivered over fifteen weeks in the second semester of the students' first year of study. The module, entitled "Enhancing Practice through Technological Innovation," seeks to encourage learners to explore opportunities for technological innovation and to locate these opportunities within the social, cultural, and technological parameters of their professional context. Through the hands-on use of various technologies, which enabled a technical understanding of the tools themselves, the learners were charged with designing, developing, and implementing digital learning objects. They would then gain a greater pedagogical understanding of the technologies by evaluating their potential value and application for learning, teaching, and assessment.

A convenience sample of seven students studying in the Master's program participated in the present study, which represents the entire year cohort for the program and provides a sufficient number of subjects for the current research methodology (Cohen, Manion, & Morrison, 2007). The cohort was comprised of mature students, who were also professionals working in diverse educational contexts ranging from information management roles to IT support to secondary, post-compulsory, further, and higher education teaching roles. While not all learners were student-facing in their role, they all had an educational development context to their profession within which they could ground their work on the assessment for the module.

The module assessment within which the ePortfolio was used required learners to produce the following digital learning objects:

- A podcast, to be used in an educational context. Depending on the student's professional role, the podcast could be targeted at either a group of learners as a teaching tool, or as a staff development tool for colleagues or other stakeholders (staff, students).
- An educational blog, giving opportunities for supporting teaching and learning. Once again, depending on the student's professional role, the blog could be targeted at a group of learners to support their studies. Alternatively, the blog could be designed to support a community of practice within the student's professional area. Part of the challenge of producing the blog was therefore for students

to engage their colleagues in meaningful discussion using the blog as a platform. The majority of students developed their blogs using Blogger as a platform (http://www.blogger.com/home), with the exception of two cases. One student chose the Teachers' Education Supplement (TES) Further Education Lecturing forum (http://community.tes.co.uk/forums/111.aspx) which allowed her to reach a broader external audience of professionals. Another student used the blog tool in the ePortfolio to set up his blog. He subsequently published this online, inviting IT education professionals from his professional contact list to participate and comment.

Both assessments further required students to provide a critical reflective commentary on the production and development process of their podcast and blog. Students developed this ongoing reflective commentary using the blog asset in PebblePAD (see Figure 2). Since the role of this critical commentary was to act as a developmental tool, students were advised to share their blog with their tutor and peers, thus obtaining regular feedback throughout the process of developing their thinking around the assessment. It is worth noting that whether and how often learners shared their blog posts with others was a matter of personal decision-making. This blog and the reflective commentary it contained provided the interactional data for analysis discussed in this paper.

Action Research

The study followed an action research methodology seeking to enhance practice in supporting learners on blended learning part-time programs. Kemmis (2006) emphasized that the primary function of action research is to problematize current practice and bring to the surface what may be perceived as "unwelcome truths" (p. 461) within the area of practice. Within this study the area that is problematized is the opportunity that the learner has to participate in a community of learners and to link this participation directly to his or her own progress in the course.

While currently the learners in this study have access to face-to-face day schools, these take place once a month and do not provide sufficient interaction and dialogue for community building. In addition, learners have access to the institutional VLE, which does offer a discussion forum tool, but it does not provide an opportunity for the learner to personalize this space. The particular module of study discussed here requires learners to generate practice in developing digital learning objects and to critically reflect on this

practice. These requirements meant that there was a need to provide links between the learners' personal space and reflection and the broader dialogue and communication with peers. The VLE alone could not meet this requirement and this opened up opportunities to consider an ePortfolio system, a different form of provision that allows for community building and personalization and that allows learners to develop critical reflection on the complex digital learning object which they were producing.

Mason and Rennie (2008) identify developing skills of critical and analytical thinking as one of the primary strengths of blogs, as well as the opportunity to gain feedback from a broader community (p. 62). However, when the priority is obtaining well considered and informative feedback, the authors point to the value of online communities and discussion forums, particularly allowing opportunities for peer support: "The asynchronous nature [of online forums] allows time for a considered response. This leads to a more profound discussion of ideas than is usual in a face-to-face tutorial" (p. 92).

The challenge for the ePortfolio to be used in the learning context of the Education Innovation and Enterprise course was to provide an environment which allowed the learner an opportunity to create his or her own learning space within which he or she could reflect on and critically analyze the creation of digital objects as required by the module outcomes. In addition, this learning space needed to offer a dialogic mechanism of support, as outlined in the conversational framework (Laurillard, 2002). Such a dialogic mechanism would further be essential for providing opportunities to establish the necessary community of learners. It is evident that, rather than using one tool for supporting learners, a combination of tools would be necessary to provide personalization, opportunities for critical analysis, and forums for feedback and support. As an aggregation of a set of versatile e-learning tools, the ePortfolio has the potential to address these complex needs.

ePortfolio Platform

The PebblePAD ePortfolio platform used within the "Enhancing Practice through Technological Innovation" module offers a personal learning space where the learner may create a variety of assets (i.e., learning objects) for the purposes of reflection (see Figure 3). The learner is then able to share these assets with specific members of his or her learning community, including peers and tutors. The ePortfolio platform chosen is widely used within UK Higher and Further education contexts, primarily for the purposes of personal development planning, continuing professional development, and formative and

Figure 2
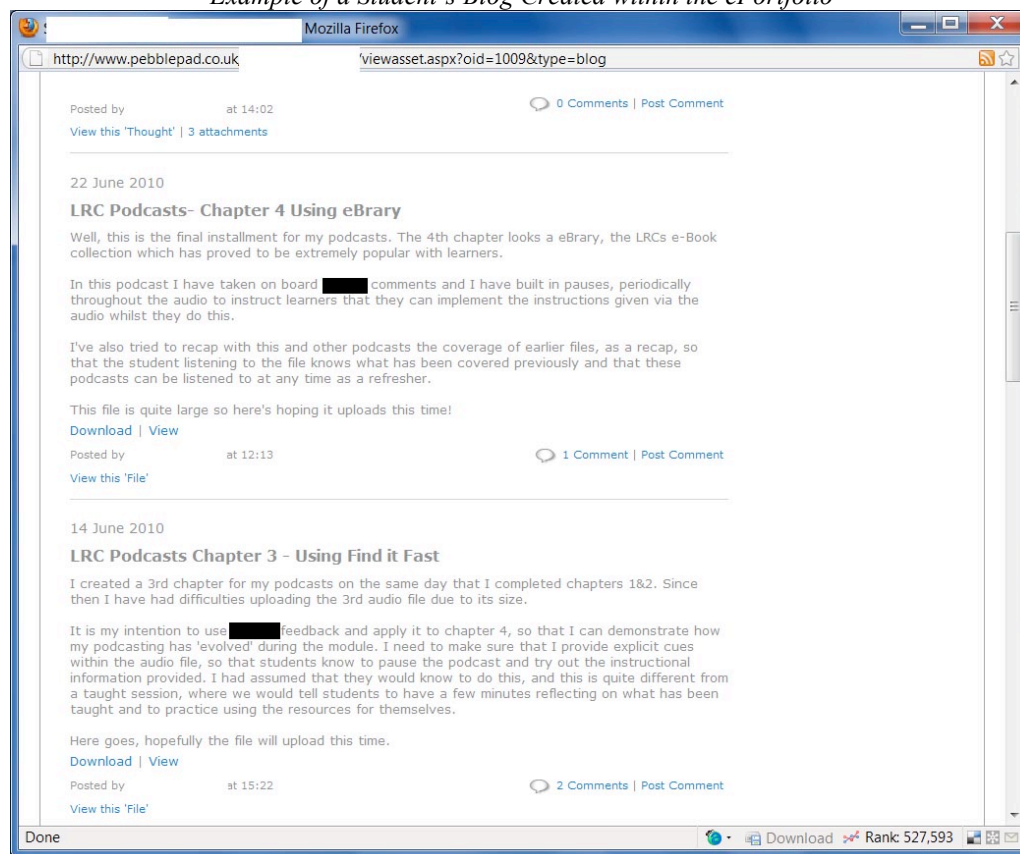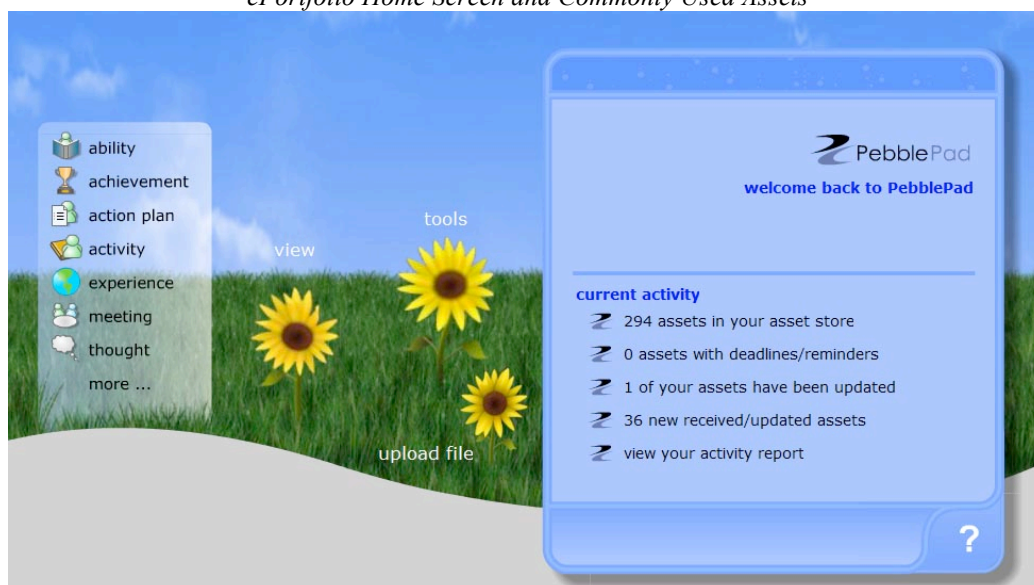*Example of a Student's Blog Created within the ePortfolio*

Figure 3
ePortfolio Home Screen and Commonly Used Assets

summative assessment purposes (Pebble Learning, 2011). It was considered appropriate for the module addressed in this study, as it offered the opportunity to share selected assets with a learning community while keeping a record of other assets for personal reference and use, thereby introducing the benefits of a personal learning environment as opposed to a more general discussion forum.

Data Collection

This action research study adopted two different methods of data gathering: a documentary analysis of the interactional content which students created through the ePortfolio (e.g., blog posts, responses to others' posts); and a focus group interview with the participating students. The blog posts analyzed were those set up in PebblePAD and contained the critical reflective commentary on the production process of the student's educational podcast and blog.

The analysis of blog posts was influenced by the methodology on a study of discussion forums by Jones and Lea (2008), which applied a textual analysis approach, focusing on understanding how and why learners use a specific tool for communication with what audiences and for what purposes. The focus is specifically on texts produced with digital technologies. Using this approach allows the analysis to focus on the motivations behind learners' posts giving an insight into what engages them in community building and under what circumstances critical reflection develops most fully.

A focus group interview was conducted in order to create an opportunity to understand the perspectives of students themselves in working with the ePortfolio. Kemmis (2006) maintains that this aspect of listening to the voice and perspectives of others besides professional practitioners is essential within an action research methodology. The focus group interview supplemented the documentary analysis data by ensuring that students' perspectives were listened to actively and their voices were not excluded from the analysis of the data. The focus group interview was carried out at the end of the process of using the ePortfolio as part of the module of study. It explored learners' perceptions of the ePortfolio as a learning space. Learners were invited to reflect on what motivated them to engage in providing peer feedback or posting thoughts on the ePortfolio. Aspects of pedagogic responsiveness of the tool were also explored such as whether learners felt in control of the ePortfolio as a space and its functions.

Data Analysis

A grounded theory approach was applied to the analysis of the data, as described by Glaser and Strauss

(1967). The data were coded in three stages as suggested by Strauss and Corbin (1998), applying open, axial, and selective coding. At the open coding stage, 30 codes were identified (see Table 1), which were then developed into categories at the axial coding stage. The axial coding stage further involved the process of constant comparison, comparing any new instances in the data with already existing codes and categories. This allowed for further analysis of the coded text and refinement of the coded categories. Several key categories emerged through the axial and selective coding stages (see Figure 4), which focused the analysis on the aspects of reflection, planning progress, peer feedback, functions of the ePortfolio, the formal or informal nature of the ePortfolio, and the development of a community of learners.

The computer aided qualitative data analysis software NVivo was used to carry out the coding. Free nodes and *in vivo* coding were used at the open coding stage. Tree nodes were used at the axial coding stage to develop categories within the data. Models and relationships within NVivo were used to provide visual representations of links within the data and to support the development of conceptual categories (see Figure 5).

Findings

Analysis of Blog Posts

Guided by Matusov et al.'s (2005) study, a focus was placed on the nature of the conversation topics in which learners engaged in order to understand whether and how these conversations worked as a useful feedback mechanism for learners. Analysis also focused on identifying whether learners adopted specific roles within the discussion and if this influenced the effectiveness of the feedback (Jones & Lea, 2008; Salmon, 2011). Several different types of posts were identified, each of which can be seen as a form of engagement in a community of learning (see Table 2). Some of these interactions served a particular purpose in the learning process, as discussed below.

"How to" posts. Early posts focused on sharing knowledge of how to address technical issues, imparting procedural and declarative knowledge; these contributions were classified as "how to" posts:

> To the rest of the group, putting expression and emotion into the recording may sound silly at the time but it does improve the recording dramatically. . . . Audacity is an easy tool to use for this process, one of the functions within audacity is the ability to change the tone, pitch, and style of your voice, this adds amusement for about 5 minutes. (Student 3)

Figure 4
Examples of Axial Coding Models Developed in NVivo
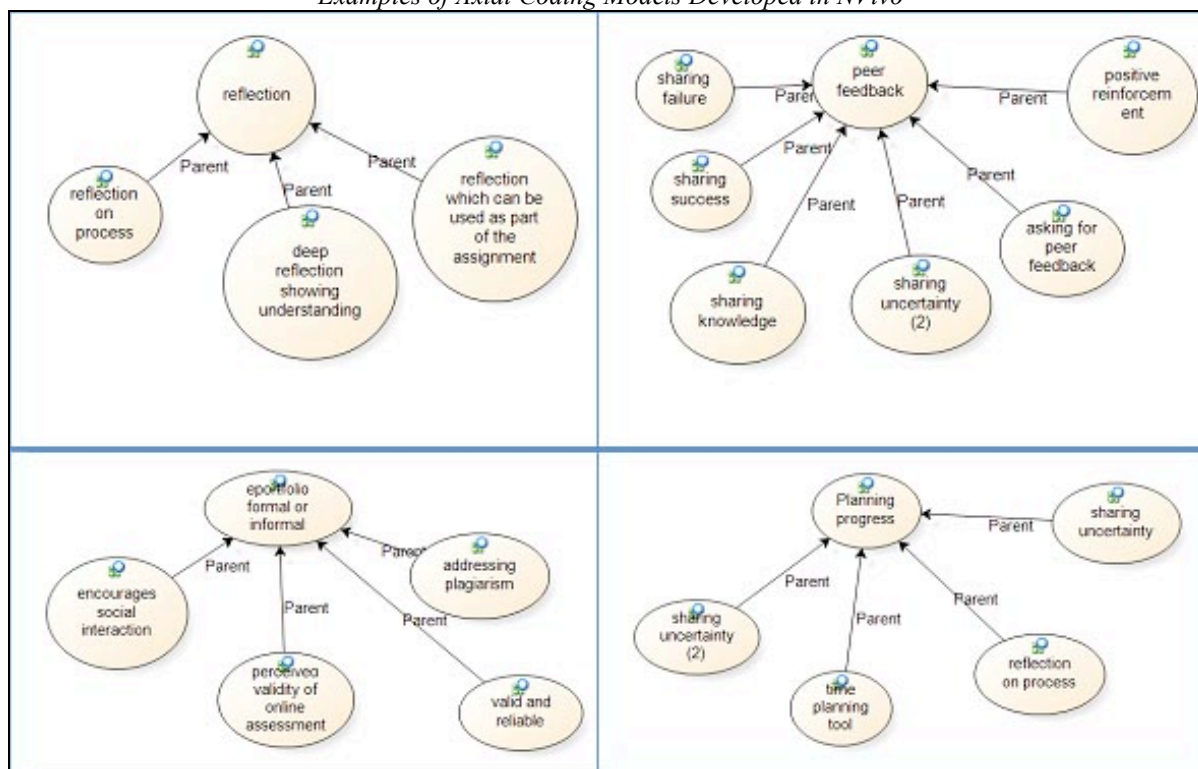
Figure 5
Node Relationships Extracted from NVivo, Showing Different Aspects of Peer Feedback Identified
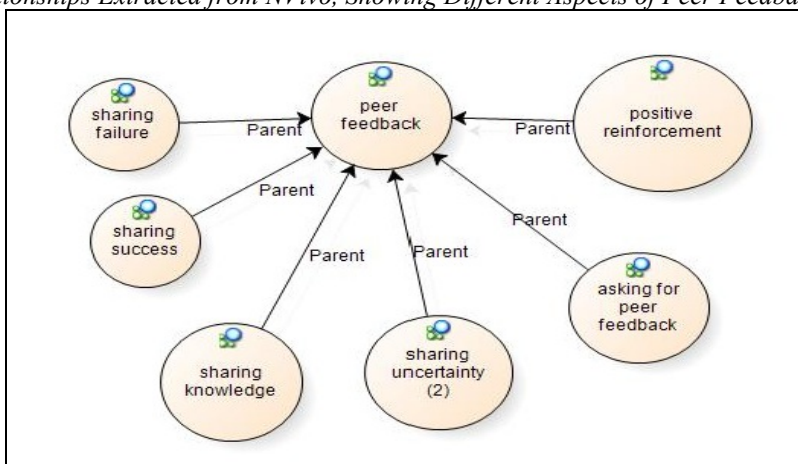
The focus of giving support on technical issues was not surprising as the module studied requires students to learn how to create e-learning objects such as blogs and podcasts, which requires some level of technical expertise. What was interesting was the learners' motivation in posting, which can be interpreted as adopting a supportive role toward others. Preece (2000)

indicates that in a successful community of learners, participants will adopt specific roles, including those of providing support to others (p. 82). The learner's comments in this case gave an indication that successful community building was taking place.

The how to posts could further be related to stage three of Salmon's (2011) five-stage model: information

Table 2
Student Comments

Sharing Success	Sharing Failure	Sharing Uncertainty
Student 2: Yeah!!!! I had a reply to my blog!!! Hi All Just jumping around in glee! I have had a reply from a STRANGER on my blog! After a couple of weeks of worrying that I would have to stand over my colleagues, friends, students, husband and the dog to reply to my blog on Blogger.com!! I decided to add my comments to an educational website called TES Connect. This was a very simple process and YES it has paid off! '	Student 3: My first attempt at creating some podcasts sounded like my voice was very expressionless and dull, I should imagine that would not make for good listening. I decided to re-do the first two and try and place some emotion in my voice so the listener may be slightly engaged. I re-worked the first two giving emotion to the words, hopefully giving them life. The finished mp3 sounded like I was being patronizing to a small child!! however, it did sound better.	Student 5: It has been some couple of weeks since I have had the blog created. I have tried to market it and disseminate amongst my current and past learners. However this has proven to be much more difficult than I anticipated. There have been some subscriptions and followers, however responses are not flowing in. In reflection this demonstrates that blogs are not widely yet appreciated for their educational purposes and many learners are still unfamiliar with them in general. One of the learners had never used one at all.

exchange. At this stage, learners engage in exploration and discovery of problems or issues through the sharing of information. Salmon (2011) defines that the role of the tutor here is to focus activity on these preparatory, planning aspects in the process of learning. As a tutor, my comments and guidance at this stage were aimed at encouraging this information exchange. The constructivist principle of the learner as an active explorer and the tutor as a facilitator of the learning interactions is evident here (Fry, Ketteridge, & Marshall, 2008). In Salmon's (2011) description of the information exchange phase shows that this kind of conversation is very similar to this which is expected to take place in VLE discussion forums.

It is important to note that all communication was student-initiated and student-led with each dialogue exchange contained within a student's ePortfolio blog. While a discussion board requires the tutor to take a lead in initiating and encouraging these interactions, my role as a tutor in this environment was supportive rather than leading. This would suggest that learners had to take control over the discursive process, and it confirms the requirement which a PLE places on the learner to be in control and to take ownership of the learning interactions. The tutor feedback undoubtedly played a role in providing direction and reinforcement but in a way that was reactive to the learner's thought process rather than proactive to initiating the exchange.

Sharing success, sharing failure, sharing uncertainty. Another type of post that was revealed through the blog discourse was students' sharing of success and failure on their ongoing work as well as sharing any uncertainty they had about the learning and

production processes in which they were engaged (see Table 2). While some of these comments are a spontaneous sharing of emotions, collectively they are a good example of reflection in action (Schön, 1996). In particular the "sharing uncertainty" comments when viewed in context proved to lead learners into planning and problem solving. Schön (1996) identifies uncertainty and uneasiness as central to the process of reflection in action:

> Many practitioners lock into a view of themselves as technical experts, find nothing in the world of practice to occasion reflection. . . . Others, more inclined towards and adept at reflection-in-action, nevertheless feel profoundly uneasy because they cannot say what they know how to do, cannot justify its quality or rigor. (p. 29)

In the same way that Schön places a value on uneasiness as a sign of a reflective practitioner and as a trigger for reflection in action, the initially shared emotive comments of uncertainty in students' blogs acted as a reflective mechanism for learners. The sharing of uncertainty led into planning progress and reflection on progress. This type of exchange further relates to stage four of Salmon's (2011) five-stage model: knowledge construction. Salmon (2011) indicates that at this stage learners interact with each other more actively, and they are further more likely to learn from each other than they are to learn from their tutor. There is evidence in the nature of learners' interactions that they needed each other's input at this stage; their commentary was directed to each other

rather than directly to the tutor. Working towards the same goals and engaging in similar processes created a need for these learners to have a forum within which to share their progress with their peers.

A deep approach to learning. In many of these exchanges, learners attached the digital learning objects they were developing (e.g., podcasts, vodcasts, links to external blogs) to their posts in order to illustrate their point to others. This type of enhanced dialogue is facilitated well through the ePortfolio which enables and encourages the linking of assets (e.g., blogs, files, action plans) as a way of providing evidence of practice and achievement, a feature strongly emphasized because of the ePortfolio's close alignment to personal development planning (Ward & Richardson, 2005). Underlying this dynamic linking of learning objects there is a deep approach to learning, which is encouraged within the PLE. As defined by Fry et al. (2008), a deep approach to learning, where the learner seeks to construct meaning rather than to complete learning tasks superficially, requires a constructivist pedagogical approach. A constructivist approach is learner centered and requires the learner to take fuller responsibility for the process of learning.

Thus the linking of content in which these learners engaged provides evidence of more than a superficial evidencing of progress; the links to digital learning objects and the reflective writing around them demonstrated a need to understand the context more fully rather than to evidence achievement. The fact that many of the posts were focused on temporary failures, setbacks, and uncertainties highlights a focus on process and understanding rather than on creating the impression that "maximum learning has taken place" as is characteristic of the surface approach to learning (Fry et al., 2008, p. 30).

The ePortfolio as a PLE offers functionality that supports this dynamic linking of digital objects to ideas and reflection. The digital content was usually linked to a blog post and shared with other learners and the tutor; this sharing of content garnered feedback from the learning community. The ePortfolio offers a space where all of these elements can be dynamically linked to collectively illustrate the learning and production processes in which the learner was engaging. This illustration would then be available to the learner for reflective review and to the tutor for formative assessment purposes. While this may be possible within a standard VLE discussion forum in terms of functionality, the learning process would not be available to the student for reflective review in the form of a learning journey in the way it would be through a PLE.

Focus Group Interview with Students

Two aspects in particular were identified within the focus group as significant in shaping learners'

perceptions of the tool: sociability and perceived validity. The aspect of personalization was a further area of focus, which revealed learners' perceptions towards the ePortfolio as a PLE.

Sociability and perceived validity. Some of the students commented on the fact that the ePortfolio encouraged informal social interaction. They found themselves involuntarily slipping into a less formal style of conversation. While they did not feel that this detracted from the quality of their thinking, they were surprised that it happened and said they would not do this in any other form of written communication with colleagues:

> Going back to an earlier point about formal-informal, when I was starting to put some thoughts to paper on the reflective commentary I found that when I was writing on the eportfolio I was slipping into a non-formal way of writing and it struck a chord with me about what is in the literature on students being very resistant to using social networking tools for educational purposes because I found myself in that position I was slipping into a more informal language which I would use on a social networking site while actually – it is actually to support me in this course of study so I have actually started writing my reflective commentary in Word because that allowed me to stick to a more academic style of writing while when trying to write it on the eportfolio. . . . (Student 4)

The social element of the ePortfolio appears to be very similar to that of online discussion forums. As Preece (2000) identifies alongside usability, sociability is one of the two essential aspects of community creation (p. 26). The "slipping into" an informal language which learners experienced can be seen as one indication of online community creation; however, this does not change the fact that learners felt negatively about the way their discussions took on an informal tone of voice. It is evident that since learners saw their interactions within the ePortfolio as formal learning, they considered that the informality of the exchanges took away some of the legitimacy of their conversations as academic practice. This leads to the question of whether online discussion forums are in fact seen as evidence of legitimate and valid academic practice by learners.

Some learners highlighted that it was important that the ePortfolio allowed for discussions and conversations to be recorded more formally, adding a date and time to all posts. They felt this gave more validity and reliability to online posts as an assessed task. This was also an indication that learners thought about the ePortfolio as a formal learning tool and support mechanism.

This dichotomy of formal and informal learning processes exists within any online learning environment

and is documented in Salmon's (2011) five-stage model; the initial stages need to allow for informality and socialization as part of community building. The later stages focus more strongly on sharing and constructing knowledge and reflecting, which naturally encourages learners to seek a reliable tool and more formal structure for their interactions. This is reflected in the comment by the student who stated that she started using Word to write out her posts before posting them on the ePortfolio. The question arises of how to respond to the learners' needs for a formal and authentic form for their dialogic interactions that at the same time benefits from the community-building aspect of socialization. This may be a matter of making clear early in the process what the rules of interaction are and what forms of communication are acceptable. It could also be the case that we need to accept that, in the later stages of their learning interactions, learners would migrate their writing from the online environment to other more "formal" tools for recording reflection.

Personalization. The students were encouraged to reflect on their perception of the kind of space which the ePortfolio offers for their learning, whether personal or otherwise. One learner specified that he did not see the ePortfolio as personal space, but at the same time he did not think about it as institutional space either. He saw it as a work area to use as part of this learning process: "I personally didn't see it as 'this is mine'. But I didn't see it as this is the college's either. I just saw it as an area to work on" (Student 3).

Another learner associated the ePortfolio as space for the course. She did say that the ePortfolio felt more personal in comparison with the institutional VLE; however, she still did not define this as "personal" space, but rather as "course specific" space: "Yes I suppose I just associate it with this course – I don't associate it with Blackboard or ___ College. . . . So I did see it as more personalized than perhaps Blackboard is for example" (Student 6).

These comments suggest that while learners identified the space as useful with relation to their work, they did not perceive it as personal space. It could be that these learners had only a limited experience of the ePortfolio and their perceptions may change after prolonged use. However, it may also be the case that learners do not consider learning spaces as personal.

Other students valued the space in terms of its unique functionality. They identified that there was a need for them to be able to construct a form of "running reflective commentary" (Student 4) on their learning process, and that the ePortfolio was the only tool available to them which offered this functionality. The element of the running reflective commentary emphasizes the value of continuity in the reflective process. This kind of continuity is less likely to happen

when reflections are posted on a general discussion forum and contributing to a common thread. Discussion forums are based on the principle of contributing to a common thread which works towards collective thinking, but can at the same time fragment the learner's personal journey. While aiming to establish a common theme for discussion the "threads" within a forum impose a certain direction; the ePortfolio, on the other hand, places the control of this direction in the hands of the learner. Its continuity allows the learner to construct a narrative of their learning journey. There was evidence that learners valued this element: "I like sort of retracing my steps" (Student 4); and "Yes that's what I am saying you can see how it develops or perhaps if you need to trace any specific aspect back you can do it" (Student 5).

Reflection naturally involves these processes of retracing one's steps, referring to previous writing. These are the activities that allow the learner to construct a narrative of his or her learning journey and subsequently aid the learner in knowledge construction. Laurillard (2002) identifies that narrative construction aids cognition and meaning making. In this way, while personalization may not be fully achieved, the ability to develop a narrative of the learning journey makes the process personal. JISC (2008) acknowledge this:

> The accumulated store of reflections, experiences, and achievements – which might include aspects of informal, unstructured learning as well as that resulting from formal education – may be called upon to present as evidence, but may also be retained as a personal document, an unfolding narrative of a unique learning journey. EPortfolio content developed purely for personal reflection and not shared with others can still support formal and more public forms of learning. (p. 8)

The valuable aspect of personalization that emerged from students' use is that of being able to construct a continuous narrative on their learning process. It appears that whether the ePortfolio is seen as personal or institutional space is not essential to the ability of the learner to construct a narrative around his or her learning journey.

Discussion and Conclusions

The purpose of this research was to explore learners' use of the ePortfolio, a personal learning environment, as a mechanism for peer support and community building. As the sample was limited to the small group taking a specific module that involved the use of the ePortfolio, the findings are not generalizable. However, the study gained some valuable insights into the patterns of use that the

learners adopted and the aspects in which learners found the ePortfolio most useful.

The findings from this study indicate that the use of the ePortfolio cannot be directly equated with learners' use of a discussion forum. Even though the two tools offer similar functionality, it needs to be emphasized that the ePortfolio seems to be more successful in offering learners a space to construct a reflective narrative around their personal learning processes and offering learners an opportunity to revisit and reflect on this process. This was evidenced both through the learners' blog posts and through their discussions within the focus group interview. Students actively linked their work in progress to their blog posts with the intention to reveal uncertainty and temporary failures, and to receive feedback on their thoughts. There was evidence of a reflective process taking place and a desire on the part of the learner to better understand this process. The focus group interview similarly revealed that learners needed to be able to revisit their reflections and the accompanying peer feedback repeatedly as part of their learning journey. Schön's (1996) model of reflection in action provides an insight into the processes that learners were going through with the help of the ePortfolio tool. Fry et al.'s (2008) definition of a deep approach to learning applies in this case as the linking of work in progress to blog posts and the dialogue developing around this aimed to develop understanding rather than to merely evidence achievement.

Salmon's (2011) five-stage model for collaborative online learning is a valuable framework for analyzing and planning activities around the ePortfolio. The stages of socialization, information exchange, and knowledge construction were visible in learners' use of the ePortfolio; the mechanisms for support at each of these stages identified by Salmon (2011) were just as applicable in the case of ePortfolio use. However, there are some clear differences in the nature of the tutor's role and the nature of the learner's participation where a PLE is concerned. While in Salmon's (2011) model the tutor has an active role in initiating, organizing, and encouraging the dialogic interactions of learners, in PLEs most of these activities are learner initiated. Therefore the PLE requires the learner to acquire a greater level of control and ownership of the learning process earlier on in the learning interactions. The findings of the study indicated that learners were able to adopt such control and ownership. Important facilitating factors were the supportive and responsive community that the learners provided for each other and the affordances of the ePortfolio as a personal learning environment. This "flattening" of the hierarchy of learning interactions as Salmon (2011, p. 48) calls it and the shift of the locus of power in initiating and leading learning interactions from tutor to learner need

further and more in-depth exploration in the context of PLEs in particular.

The culture of support and sharing which unfolded in students' interactions, evidenced in the "how to" posts and "sharing success, sharing failure, sharing uncertainty" posts confirmed ideas by Preece (2000) on the value of socialization and role taking within discussion forums and on the supportive nature from which communities develop (Jones & Lea, 2008). This helps make the argument that the ePortfolio can contribute to the building of communities of learners just as well as a VLE discussion forum. Therefore, there are significant benefits to adopting the ePortfolio as an additional mechanism for socialization in distance or blended learning environments.

The perceived informality of the discussions which developed from the students' point of view raises the question of how to address the dichotomy of the informal language used in online discussions which encourages socialization (inherent to learning) and the need for a legitimate tool for supporting students' learning interactions. It is necessary to listen to students' concerns in this respect; learners valued the aspects of the ePortfolio that presented their interactions within the ePortfolio as formal and legitimate learning. Thus, the rules of interaction and the forms of communication that are acceptable need to be clearly stated as the norms of ePortfolio use and communication.

In conclusion, the essential aspects of peer support, community building, and reflection seemed to be well supported by the ePortfolio in this case. It is necessary to explore further whether there are specific mechanisms that need to be put in place in order to support the early personalization required with ePortfolio and articulate these as part of an operational framework for ePortfolio use.

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Improving the Quality of Evidence-Based Writing Entries in Electronic Portfolios

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The problem investigated in this study was whether entries written to an electronic portfolio by preservice teachers improved in quality after an intervention was deployed. The study also compared portfolio metadata to writing quality scores to determine whether there was a relationship. Participants included a convenience sample of 11 undergraduate students enrolled in a teacher education program. Primary analyses focused on comparing portfolio entries, written before and after the intervention, using a repeated measures design. Secondary analyses involved calculating correlations between writing quality and portfolio metadata. Results showed that writing improved at a statistically significant level, $t(10) = 4.99$, $p < .001$, $d = 3.16$, 95% CI = 1.91 to 5.00. In addition, statistically significant correlations were found between writing quality and the number of unique terms shown on portfolio tag clouds, $r = .60$, $N = 11$, $p < .05$, $d = 1.50$, as well as writing quality and the total number of portfolio entries, $r = .72$, $N = 11$, $p < .05$, $d = 2.08$. These findings suggest that the intervention improved writing quality on entries made to electronic portfolios and that metadata predicted the quality of portfolio content.

A standard represents something that is widely accepted by authorities, or consensus, and it is used to make comparisons or shape behavior. Since the 1990s, educational reformers have organized their efforts around standards as a way to promote educational equality (Meier, 2000; Urban & Wagoner, 2009). Teachers and administrators in K-12 settings have been contending with standardized assessments, published standards, and more recently, Common Core Standards since this time.

Teachers and students in higher education have not escaped the momentum of education reform (Hill-Jackson & Lewis, 2010; Moss, 2007). The initiatives first encountered in primary and secondary classrooms are manifesting themselves as reworked accountability systems for students in post-secondary settings. For example, according to Basken (2007), hundreds of colleges are using standardized student-achievement data to allow for comparisons between institutions. These colleges are also posting performance-related data on their web sites to promote transparency.

Whether in K-12 or higher education settings, a significant feature underlying many of these accountability systems is evidence-based learning (Millett, Payne, Dwyer, Stickler, & Alexiou, 2008), which consists of soliciting student thinking on a particular problem, building consensus around a solution, and gathering evidence to support the solution and compare its outcome to a standard (Eitel & Steiner, 1999). The focus on evidence, comparison, and standards constitutes the core set of ideas upon which accountability and evaluation systems are predicated. However, another facet, arguably more student-centered and aligned with principles of folio thinking, is using evidence-based learning as a way to promote achievement through repeated cycles of reflection and assessment. Eitel and Steiner (1999) identify this analytical process as the "plan-do-check-act-cycle" (1999, p. 510).

Evidence-based learning is a model which is particularly useful to programs that train students to adopt and use professional practices and standards, such as teachers, nurses, doctors, lawyers, engineers, and clergy (Carnegie Foundation, n.d.; Scharton, 2013). Teacher education is a fitting example since education students are subject to national, regional, and state accountability initiatives. Specifically, students enrolled in teacher training programs engage in evidence-based learning as a way to demonstrate competency on professional knowledge and skills and to complete requirements for licensing (Cambridge, Cambridge, & Yancey, 2009). Along with showing a positive impact on achievement, these models also fulfill accreditation requirements, which are applied to licensing programs through multiple oversight organizations (Ewell, 2006, Schechter, 2007). For example, the National Council for Accreditation of Teacher Education (NCATE) requires that teacher candidates demonstrate knowledge of content, pedagogy, and the profession, along with showing the necessary dispositions for helping all students learn (National Council for Accreditation of Teacher Education, 2012).

Moreover, teacher candidates are required to master the broader standards established for the particular college or university that they attend. For example, the Association of American Colleges and Universities (2012) has indicated that graduates be prepared for twenty-first century challenges by learning how to think critically and creatively, along with showing continuous improvement of their communication skills.

The purpose of these systems, whether deployed within K-12 or post-secondary settings, is to promote

accountability and improve learning outcomes. One way that policymakers and researchers organize these systems is around curriculum, instruction, and assessment (Pellegrino, 2006; Porter & Smithson, 2001). However, governing bodies, such as state departments of education, have typically invested more time and resources in developing standards and assessments, which tend to govern instructional methods (Resnick, Rothman, Slattery, & Vranek, 2004).

Nevertheless, accountability and competency requirements for, and measures of, teachers in training have caused schools of education to integrate an evidence-based learning approach with additional procedures for recording and showing preservice teacher knowledge and skills (Barrett & Knezek, 2003; Wilhem et al., 2006). For more than 20 years, paper-based portfolios were the leading method for displaying this type of evidence (Ayan & Seferoglu, 2011; Barton & Collins, 1993). Shulman (1998) defined portfolio as a "structured documentary history of a (carefully selected) set of coached or mentored accomplishments substantiated by samples of student work and fully realized only through reflective writing, deliberation, and serious conversation" (p. 23).

Evidence-Based Learning and Assessment

As part of this evolution, advances in technology and increasing accreditation requirements, such as the need to track student progress on performance of standards over time, have made electronic portfolio systems more appealing to program administrators (Pecheone & Stansbury, 1996; Smith, Cook, Faulkner, & Peers, 2007; Zeichner & Wray, 2001). One reason for this is that training programs are required to show that exiting students have mastered specific knowledge and skills for employment (Yao, Aldrich, Foster, & Pecina, 2009). As a result, many schools of education have adopted portfolio systems, sometimes referred to as digital portfolios, e-folios, ePortfolios, or web-folios, to take advantage of efficiencies and technological enhancements, such as searching, retrieving, changing, linking, and organizing narratives and artifacts (Strudler & Wetzel, 2005).

Defining Electronic Portfolio

According to Abrami and Barrett (2005), an electronic portfolio is "a digital container capable of storing visual and auditory content including text, images, video and sound" (p. 2). Electronic portfolios contain many of the same features as paper-based portfolios. However, there are several advantages to electronic portfolios, including the ability to create hyperlinks, show metadata, and share contents efficiently with multiple viewers (Abrami & Barrett, 2005).

Wilhelm et al. (2006) distinguishes between two types of electronic portfolio platforms, including generic tools (e.g., WordPress and Blogger) and customizable vendor tools (e.g., TaskStream and LiveText). Both generic and vendor-based portfolio systems are implemented as an approach to evidence-based learning and assessment design, where the principle goal is to align standards to products and processes (Millett et al., 2008). Learning focused on generation and analysis of evidence is based on the identification of desired outcomes. In teacher education programs, desired outcomes are typically aligned with lists of knowledge and skills, also known as professional standards. These standards are authored by professional organizations or more likely, they are dictated by government legislation (Millett et al., 2008). Once professional standards are established, then system designers identify the types, and amount of evidence necessary for showing mastery. Mastery is demonstrated as portfolio authors engage in evidence-based learning, specifically through the presentation of claims and arguments which are connected to professional standards and artifacts through logical explanation.

Assessing evidence-based learning depends upon the complexity of the claims, standards, and evidence, along with consequences associated with results, such as the decision to license an education student for service. Since licensing is a significant decision, sophisticated evaluation systems are necessary to ensure the validity and reliability of evidence-based assessment results (Millett et al., 2008). Although Yao et al. (2008) found that electronic portfolios were insufficient for showing validity and reliability of teacher competence, most researchers agree that they do provide efficient and stable repositories of evidence-based learning (Abrami & Barrett, 2005; Smith et al., 2007; Wilhem et al., 2006). In addition, electronic portfolio authors are able to show a wide range of evidence, as suggested by Abrami and Barrett (2005), while also enabling them to synthesize this evidence into complex arrays of performance data. Synthesized performance data is one of the factors that contribute to valid and reliable assessments (Mislevy, Almond, & Lukas, 2004).

Writing and Portfolio Content

Although electronic portfolios enable authors to include a broad array of data, the most common type of content is writing. This writing appears in different formats, such as descriptive, analytical, and reflective. As a result, assessing an electronic portfolio also means simultaneously assessing the quality of the writing

shown on it. Assessment systems that require written responses will necessarily involve the evaluation of writing skill (Millett et al., 2008). One result of this relationship is that the writing shown on electronic portfolios can be a source of construct-irrelevant variance, especially if the purpose of the portfolio is to assess professional knowledge and skills (Mislevy et al., 2004). Alternatively, if performance standards are aligned with writing, or perhaps more broadly with communication, then writing ability will decrease as a source of construct-irrelevant variance. Although professional teaching standards do include elements of communication, in teacher education the emphasis tends to focus on profession-specific abilities, such as parent and community involvement, planning for instruction, classroom management, and so on.

Whether communication skills are acknowledged or ignored as an element of electronic portfolio use, there is clearly a relationship between the quality of writing used to construct portfolio entries and portfolio performance. Carney (2006) and Yao et al. (2009) have suggested investigating this relationship, specifically in the area of teacher education. Nevertheless, searching the Educational Research Information Center database for the terms "electronic," "portfolio," and "evidence" produced five current studies published in peer-reviewed journals that applied experimental or quasi-experimental methodology. Each of these studies examined writing assignments, aligned with principles of evidence-based learning, presented in an electronic portfolio format.

Previous Research Relating to Electronic Portfolios and Evidence-Based Learning

Although the analysis of previous research is limited in its scope, primarily as a result of the small number of studies which met search criteria, it does suggest some trends. One of these is that writing assignments focused on evidence-based reasoning and presented in electronic portfolios have a positive effect on preservice teacher knowledge and skills (Ayan & Seferoglum 2011; McIntyre and Dangel, 2009; Shepherd & Hannafin, 2011). However, there is limited consensus about this. For example, two studies, by the same principal author, suggest that the correlation between portfolio performance and measures of teacher competency were weak or nonexistent (Yao et al., 2008; Yao et al., 2009). Another trend is that studies tended to use qualitative methodology, such as observation, interview, and self-report data. Likewise, most studies included small sample sizes ($N < 10$). Finally, most of the studies used vendor-based portfolio systems, such as Taskstream and LiveText, although one study reported using WordPress blogs as a portfolio container. While this final trend does not address

factors associated with writing quality and portfolio performance, it does have implications for how writing is assembled and presented.

With regard to assessing knowledge and skills, McIntyre and Dangel (2009) examined the effects of having six preservice elementary teachers complete electronic portfolio assignments based on teaching standards during a semester of internship. According to results collected from observations and interviews, participants reported that portfolio assignments increased their knowledge of professional standards and provided a method for showing growth in teaching ability.

In a similar study, Yao et al. (2009) examined the effects of deploying electronic portfolio assignments on preservice teacher knowledge and skills by collecting and analyzing interview data. Participants included eight preservice teachers. Interview data showed that participants perceived that portfolio assignments improved their capacity for reflection. However, participants also reported that the portfolio was not an accurate representation of teaching competence.

Another study by Yao et al. (2008) involved analysis of nearly 200 preservice teacher portfolios using quantitative measures. Results showed that portfolio performance was not correlated with other metrics of teaching ability. For example, Yao et al. found that portfolio scores were not predictive of standardized tests scores associated with general aptitude or subject matter competency, such as the ACT, C-Base, or Praxis II. However, portfolio scores did show a statistically significant relationship when compared to grade point average (Yao et al., 2008).

Ayan and Seferoglu (2011) analyzed the contents of portfolio entries from eight undergraduate preservice teachers during a semester of student teaching. Similar to the findings of Yao et al. (2008), who suggested that portfolio assignments were not predictive of teaching competency, results showed that participants wrote descriptions twice as often in comparison to analytical or evaluative compositions. Nevertheless, results from interview data also showed that participants believed that regular portfolio assignments helped them analyze their beliefs about instruction and classroom-based decision making (Ayan & Seferoglu, 2011).

Contrasting the study by Ayan and Seferoglu (2011), Shepherd and Hannafin (2011) designed an intervention incorporating specific portfolio writing instructions, including question prompts, assignment directions, and technical support materials. The study by Shepherd and Hannafin (2011) involved six participants, who completed three extensive assignments, consisting of four parts each. For these three assignments, participants responded to multiple questions about lesson planning and analysis and examination of student evidence. Results from

interview data showed that explicit instructions on portfolio assignments improved participants' ability to examine evidence and write plans for improving their instruction (Shepherd & Hannafin, 2011). However, participants reported needing individualized support and coaching due to the sophistication of the assignments (Shepherd & Hannafin, 2011).

With the exception of the study by Yao et al. (2008), which calculated correlations, and the study by McIntyre and Dangel (2009), which reported mean portfolio scores, all of the results in this summary were derived through qualitative methodology. Moreover, none of the studies used pretest-posttest methods of comparison or analysis of metadata. One possible explanation for the absence of metadata is that researchers from three of the six studies were using vendor-based portfolio systems, which are unable to generate this kind of information. Ayan and Seferoglu (2011) did report using WordPress, which is a blog platform that shows metadata through tag clouds and archives; however, these factors were not analyzed.

Lastly, none of the studies, except for the one by Shepherd & Hannafin (2011), examined interventions related to writing. This is notable since writing is an important method for presenting electronic portfolio content (Abrami & Barrett, 2005; Shulman, 1998).

Research Questions

The summary of research suggests that additional studies are needed to examine the relationship between writing quality and portfolio performance using quantitative measures, such as pretest and posttest methods, along with analysis of metadata. The purpose of the study described here was to operationalize evidence-based writing, investigate the relationship between writing quality and portfolio performance, and determine the effects of a writing intervention on the quality of teacher candidates' electronic portfolio entries. Specifically, research questions for this study included the following:

1. What is the relationship between writing quality and portfolio performance?
2. How do writing interventions affect entries written to electronic portfolio?
3. What is the relationship between writing quality and electronic portfolio metadata?

Method

Context of Study

The participants for this study consisted of a convenience sample of undergraduate students enrolled in a teacher preparation program. Participants included 11 seniors, 10 females and one male, who had completed 10 weeks of a 20-week teaching internship. These participants were scheduled to graduate within three months from the time that the study took place. Six participants were earning endorsements in elementary education, two in physical education, two in elementary special education, and one in secondary special education. The group consisted of participants from European descent only. The mean grade point average for the sample was 3.43.

Participants had created electronic portfolios nine months before the beginning of the study, using WordPress blogs. Each portfolio showed a landing page, or blog page, along with four auxiliary pages showing professional teaching standards. Each portfolio showed a tag cloud and archive.

Participants began writing entries to their portfolios at an average rate of one every two weeks. The contents of portfolio entries varied. For example, some described instructional theory, presumably written for a specific course; while other entries recounted events based on classroom observations. These entries were assessed by course instructors and practicum supervisors using a variety of methods, such as comments and points.

Primary Measure

Three portfolio entries were scored for each student using a repeated measures design. Two of these entries were written by participants and assessed by the instructor before the intervention was deployed. The oldest entry, further referred to as the first entry, was written nine months before the intervention was administered. The next entry, further referred to as the second entry, had been written between one day and one month before the beginning of the intervention. The third entry was written during intervention. The intervention lasted one hour, spread across two class sessions. Class sessions were separated by one week. Participants wrote, and then revised, their third entry outside of class. The first, second, and third entries were scored for writing quality. Writing quality was operationalized using a rubric, further referred to as the writing quality rubric (see Appendix).

This rubric contained five columns and two rows. Columns were scaled from 0 (*deficient*) to 4 (*exemplary*). The first row assessed the integration of artifacts used to show evidence of teaching competence. Artifacts included lesson plans, student work samples, teaching videos, or course papers, among other items. To achieve a score of 2 or above on this criterion, participants had to reference the artifact and interpret or evaluate its impact on their practice or student learning. The second row assessed the participants' analysis and evaluation of their teaching in comparison to a given professional standard. To achieve a score of 2 or above

on this criterion, participants had to reference the professional standard, analyze and evaluate their performance in comparison to the standard, identify significant conclusions about their teaching practice, and support their conclusions by referencing the artifact.

Descriptors, or cells, for each level of performance on the rubric were taken from VALUE assessments (AACU, 2012). The rubric was evaluated for reliability by calculating a Pearson correlation coefficient based on data taken from five observations made by two scorers, for three participants, comparing the first and third entries. Results showed a correlation of .82.

Primary Tests

Two paired sample t-tests were conducted to analyze differences between the writing quality of the first and third entry and the second and third entry. Although this study involved a relatively small sample size, calculating a large Cohen's d effect size, .80 or above, at an alpha level of .05, with three measures, required a statistical power of at least .93 (Faul, Erdfelder, Buchner, & Lang, 2009). Results from paired sample t-tests showed effect sizes well above the .80 threshold.

In addition, descriptive statistics showed that scores on the second and third entry were sufficiently distributed for parametric analysis, with skewness and kurtosis values below 1 (see Table 1). However, this was not the case for the first entry. The uniform distribution of results on the first entry were the outcome of participants scoring either one point or no points on the writing quality rubric, $M = .55$.

Secondary Tests

Participants' third entry was also scored according to a four-point scale of reflective writing designed by Kember, McKay, Sinclair, and Wong (2008). The original Kember et al. (2008) scale identified four levels of reflective writing according to letter designations, including (a) *critical reflection,* (b) *reflection*, (c) *understanding*, and (d) *nonreflection*. These letters were assigned numerical values from 4 to 1, respectively, and then used to assess the third entry ($M = 3.18, SD = .41$).

In addition, two types of metadata were collected from student portfolios before implementing the intervention. Each portfolio showed a tag cloud and archive (Figure 1). The number of words or phrases, further referred to as terms, in each tag cloud were counted ($M = 18.36, SE = 10.42$). Course numbers and generic titles were excluded (e.g., "EDU 1234," "weekly blog," "entry #4"). The total number of portfolio entries was also counted by summing from the numerals shown on each portfolio's archive menu ($M = 23.00, SE = 9.92$).

Scores from another portfolio assignment, which were not used to answer the research questions for this study, showed positive correlations with the number of tag cloud terms and total portfolio entries. The correlations were statistically significant (mean $r = .64$, $N = 11$, $p < .05$), indicating some convergent validity between writing quality and metadata.

Three Pearson correlations were calculated between writing quality scores for the third entry and the following predictor variables: (1) level of reflective writing defined by Kember et al. (2008), (2) tag cloud term count, and (3) total number of portfolio entries.

Intervention

The writing intervention included the following instructional practices: (1) explicit direction on content and format, (2) communication of assessment criteria, (3) evaluating evidence, (4) instructor and peer feedback, and (5) revising. These practices were deployed as participants began writing their third portfolio entry. Graham and Perin (2007) identified these methods as characteristic of the following approaches to writing instruction: procedural facilitation, product goals, inquiry, feedback, and process writing. According to Graham and Perin (2007), these instructional practices have a positive impact on writing skill and writing quality.

The intervention began with participants reading a short list of instructions, which provided a general description of the electronic portfolio writing assignment. This activity lasted approximately five minutes.

Following this, the instructor showed the assignment rubric to participants and identified its six criteria and four-point scale. The assignment rubric was similar to the writing quality rubric in two ways. First, each rubric indicated that participants were to cite a specific program standard and to write content that showed competence on this standard. Citing the program standard meant that participants were to identify the complete teaching standard, either verbatim, or to define it in their own words. Participants were instructed to organize the content of their writing around this standard. Second, each rubric indicated that participants were to show and reference an artifact. Showing and referencing an artifact meant that participants were to support their written conclusions with evidence. Evidence could include images, attachments, and screenshots of student work samples, lesson plans, and videos or pictures of teaching, among other items. However, the assignment rubric showed four additional criteria including word count,

Table 1
Descriptive Statistics for First, Second, and Third Entries

Entry	M	SD	Skewness	Kurtosis
First	.55	.52	.21	2.44
Second	2.36	1.70	.82	.88
Third	5.82	1.08	.43	.83

Figure 1
Example Portfolio Tag Cloud and Archive
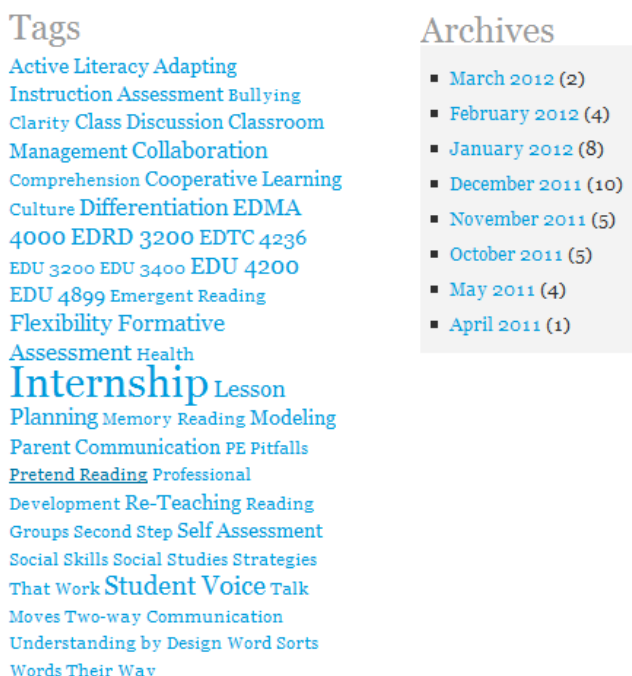
Note. Terms in the tag cloud increase in size depending on the number of times the term is associated with an entry. The numbers in parentheses on the Archives menu show the number of entries submitted that month.

mechanics, on-time submission, and citation of an authoritative source, such as an article or textbook.

After the instructor discussed writing expectations and presented the assignment rubric, participants had five days to compose their entries. At the conclusion of the five days, participants submitted their entries for formative feedback from the instructor. Participants accessed feedback online through a learning management system. Although the instructor used the assignment rubric to generate feedback, a numerical score was not assigned. Rather, the instructor indicated (1) how the entry met or exceeded the criteria of the assignment rubric, and (2) specific areas of weakness needing revision.

During the next class session, after submitting the third entry and receiving feedback online, participants read their entry aloud to a peer with a paper copy of the assignment rubric nearby. Participants then discussed the entry using the rubric as a guide. Listening peers made suggestions for improvement. Participants switched reading aloud and listening roles and repeated the process.

After this activity, which took approximately 15 minutes, the instructor asked participants to revise and resubmit their entries. One day later, the instructor scored revised entries using the writing quality rubric.

Results

Primary Test Results

A paired sample t-test was conducted to evaluate whether the quality of participants' third portfolio entry improved in comparison to the second entry. Results indicated that the mean score for the third entry ($M = 5.82$, $SD = 1.08$) was significantly greater than the

mean score for the second entry, $M = 2.36$, $SD = 1.70$, $t(10) = 4.99$, $p < .001$. The standardized effect size index, d, was 3.16, with some overlap in the distributions for rubric scores between the second and third entries, as shown in Figure 2. The 95% confidence interval for the mean difference between the two ratings was 1.91 to 5.00.

A second paired sample t-test was conducted to compare differences between the writing quality of the third and first entries. Results indicated that the mean score for the third entry was significantly greater than the mean score for the first entry, $M = 0.55$, $SD = .52$, $t(10) = 22.24$, $p < .001$. The standardized effect size index was 14.07, with no overlap in the distributions for rubric scores between the third and first entries, as shown in Figure 2. The 95% confidence interval for the mean difference between the two ratings was 4.75 to 5.80.

Secondary Test Results

A Pearson correlation was computed to assess the relationship between scores for the writing quality of the third entry and scores assessing the level of reflection in written work (Kember et al., 2008). Results showed a statistically significant correlation, $r = .77$, $N = 11$, $p < .01$, $d = 2.41$.

A second correlation was computed to assess the relationship between the third entry and tag cloud term counts. There was a statistically significant correlation, $r = .60$, $N = 11$, $p < .05$, $d = 1.50$. A final correlation between third entry writing quality scores and the total number of portfolio entries was calculated, and it also showed a statistically significant result, $r = .72$, $N = 11$, $p < .05$, $d = 2.08$.

A summary of these findings, displayed as a correlation matrix, is shown in Figure 3.

Discussion

Relationship Between Writing Quality, Portfolio Performance, and Writing Intervention

The quality of student writing improved significantly in comparison to entries written before the intervention. This finding corroborates research by Graham and Perin (2007) who found that writing interventions aligned with procedural facilitation, product goals, inquiry, feedback, and process writing, improved participants' writing skill and writing quality. However, writing quality in this study was defined according to characteristics of evidence-based learning, specifically integration of artifacts and evaluation of teaching in comparison to a given professional standard. In addition, participants' third entry showed reflective writing, characterized by descriptions of

theory and practice, practicum experiences, and personal insights about teaching (Kember et al., 2008). Similarly, studies by Ayan and Seferoglum (2011), McIntyre and Dangel (2009), and Shepherd and Hannafin (2011) also found that entries written to electronic portfolios improved participants' awareness and understanding of professional standards.

Alternatively, Yao et al. (2008) found portfolio scores correlated with grade point average, but not other measures, such as standardized tests associated with general aptitude or subject matter knowledge. Likewise, results from this study showed correlations between the scale developed by Kember et al. (2008), which assessed levels of reflective writing, and the writing quality of the third entry. However, these are largely measures relating to writing skill, with content focused on professional standards, analysis of evidence, and reflective composition. Whether quality portfolio entries predict real professional effectiveness is an important question, but it is also a question outside the scope of this study. Nevertheless, since portfolio entries correlated with the Kember et al. (2008) scale, there is at least some indication that the level of reflection shown on portfolio entries changed as a result of the intervention.

Relationship between Writing Quality and Electronic Portfolio Metadata

The metadata analyzed in this study, including the number of unique terms in a tag cloud and archives showing the total number of entries, was predictive of the writing quality of the third entry. Notably, the total number of portfolio entries was a stronger predictor of writing quality in comparison to the number of terms shown on a tag cloud. These results suggest that metadata is useful to instructors as an informal assessment measure of the general writing quality of electronic portfolio entries. However, including metadata as an electronic portfolio feature only appears to be available through generic tools, such as WordPress and Blogger.

Limitations

This study included three notable limitations. The sample size was small, and represented mostly females. However, studies by Ayan and Seferoglu (2011), McIntyre and Dangel (2009), and Shepherd and Hannafin (2011) involved sample sizes with less than 10 participants and also included mostly females. In addition, the principal investigator was also the instructor, which can lead to reactivity bias (Slavin, 1992). Nevertheless, educational studies, involving investigators who deploy interventions, are not uncommon (Dignath & Büttner, 2008). For example,

Figure 2
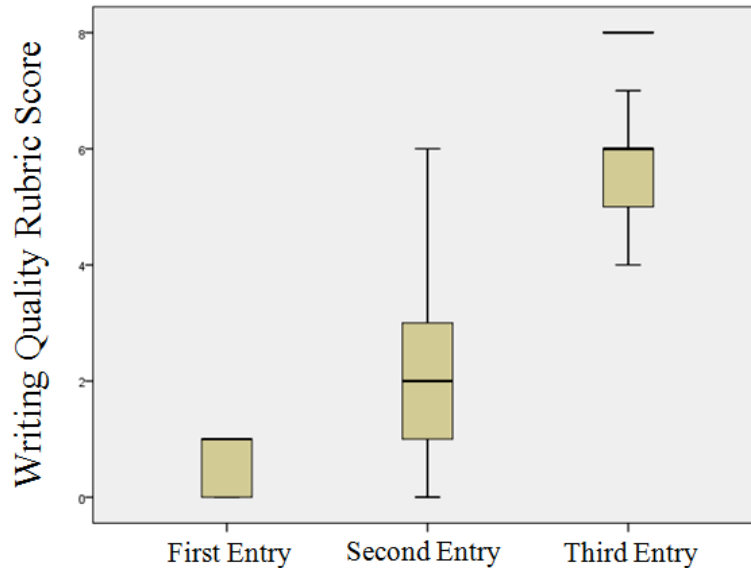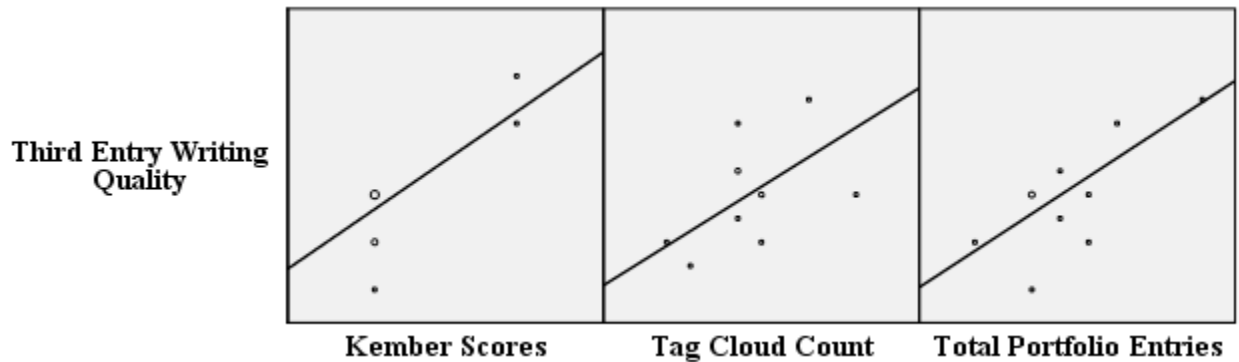*Boxplots of Writing Quality Rubric Scores for the First, Second, and Third Entries*

Figure 3
Correlation Matrix

Note. The matrix shows statistically significant relationships between scores for the writing quality of the third entry, level of reflective writing (Kember et al., 2008), tag cloud term count, and total number of portfolio entries.

Jenson (2011) acted as the instructor and investigator in a study examining participants' self-regulation and use of electronic portfolios, without identifying the potential for reactivity as a limitation. Finally, this study used a narrow definition of writing quality, which was operationalized using specific criteria, derived from characteristics of evidence-based learning and VALUE assessments (AACU, 2012). However, these characteristics were specifically chosen to assess written entries made to electronic portfolios, focused on the ability of preservice teachers to reference evidence, integrate teaching standards, and write meaningful conclusions about their practice.

Conclusion

One implication from this study is that electronic portfolio assignments designed to assist students with writing promotes outcomes aligned with specific evaluation criteria. In addition, rather than assigning a reflection with little or no direction, which students tend to define in different ways (Gustafson & Bennett, 2002), instructors may improve the results of written entries by (1) giving explicit direction on content and format, (2) communicating the assessment criteria, (3) requiring evaluation of evidence, (4) providing feedback, and (5) permitting revisions. However, these strategies may not be appropriate for soliciting open-

ended and exploratory responses in the context of problem-based learning or ill-structured settings. Rather, these strategies are more likely to serve instructors in their efforts to align portfolio content with specific professional standards or evaluative criteria.

A valid argument related to the use of electronic portfolios for purposes of alignment is that it reduces opportunities for authors to engage in reflection and self-actualization. This is a fair criticism. Indeed, Barrett and Knezek (2003) cautioned against using electronic portfolios exclusively for assessment purposes. Nevertheless, professional training, especially teacher education programs, are using electronic portfolios to satisfy certification and licensing requirements. As a result, some examination of how portfolios can be used to accomplish both student-centered and profession-centered goals is warranted.

Finally, since electronic portfolios are used for purposes that extend beyond student-centered learning and growth, it is likely that instructors will increasingly adopt practices to align portfolio content with system-defined outcomes, at least in professional education settings. An important question related to this is whether the instructional practices, useful for alignment, have a permanent or temporary effect on the quality of portfolio entries once support is withdrawn. More broadly, there is research to suggest that electronic portfolios are being partially subsumed into education reform efforts. These efforts emphasize a finite set of ideas, such as evidence, comparison, and standards, along with accountability and transparency. It is important to determine if integrating reform-based practices with electronic portfolios has as real and lasting effect. Research related to either of these questions is sure to be informative. Perhaps more importantly, investigating these questions will assist teachers and students in managing education reform efforts as they exert an influence on how electronic portfolios are used.

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Acknowledgements

Appendix
Writing Quality Rubric

	0 - Deficient	1 - Progressing	2 - Competent	3 - Proficient	4 - Exemplary
Artifacts	No evidence, reference, or description of artifacts appears.	Evidence from artifacts is shown without any interpretation or evaluation.	Evidence from artifacts is shown with some interpretation and evaluation, but not enough to develop a coherent analysis or synthesis.	Evidence from artifacts is shown with enough interpretation and evaluation to develop a coherent analysis or synthesis.	Evidence from artifacts is shown with enough interpretation and evaluation to develop a comprehensive analysis or synthesis.
Analysis and Evaluation in Comparison to Professional Standard	No evidence to show integration of professional standards.	Identifies connections between professional standards and coursework assignments or reflections to show an emergent understanding of teaching and learning.	Analyzes connections between professional standards and coursework assignments or reflections showing an understanding of teaching and learning.	Meaningfully evaluates and synthesizes professional standards with coursework assignments and reflections to deepen understanding of teaching and learning.	Meaningfully evaluates and synthesizes professional standards with coursework assignments and reflections along with integrating other experiences to deepen understanding of teaching and learning.

Criterion and cell descriptions were derived from "Valid Assessment of Learning in Undergraduate Education" (VALUE) rubrics, authored by the Association of American Colleges and Universities (2012).

Class Syllabi, General Education, and ePortfolios

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A study of undergraduate student experience with class syllabi revealed several concerns for improvement in areas directly related to General Education and assessment strategies using electronic portfolios. We report several student interests and suggestions, including the need for consistent syllabi that contain information designed to promote success in classes. Students report that faculty members teaching General Education courses have not adequately engaged in helping them with electronic portfolio requirements. Results of this study suggest that better communication, through carefully constructed syllabi, is needed to connect students and instructors to the importance of General Education and the use of electronic portfolios for assessment and student documentation of learning.

Several studies of class syllabi have attempted to characterize useful attributes and functions in a variety of contexts. Syllabi are often considered a "contract" between instructors and students (Garavalia, Hummel, & Wiley, 1999; Parkes & Harris, 2002; Smith & Razzouk, 1993). However, as with any document, syllabi are subject to errors or inattention (Baecker, 1998; Parkes, Fix, & Harris, 2003) and may not serve the intended purpose or meet expectations of all parties involved. Our aim was to explore how effectively class syllabi were being used as a form of communication about the goals and expectations of General Education courses and how those goals were meshed with the requirement of students to document learning using electronic portfolios.

Most US academic institutions have some form of core educational requirements for undergraduate students, often known as General Education (Gen Ed). The regional accrediting body of Clemson University requires 30 credit hours of Gen Ed for each student, which represents roughly a quarter of the credits needed for graduation. Our Gen Ed program requires the completion of courses in the areas of mathematical/scientific/technological literacy, arts and humanities, social sciences, science and technology in society (STS), and cross-cultural awareness. In addition, students receive instruction within their disciplinary major in the areas of communication, critical thinking, and ethical judgment. Undergraduates are required to document achievement of competency in each area of Gen Ed by submitting examples of their work to an electronic portfolio (ePortfolio). Successful completion of the ePortfolio is required for graduation.

Changes to the General Education curriculum at Clemson University, and the consequent implementation of new student learning competencies, has raised interest among students and faculty about communicating these requirements and the use of ePortfolios for documenting learning outcomes. Students deposit course artifacts (e.g., essays, projects) into their ePortfolios to demonstrate General Education competencies and compose short rationale statements to reflect on their learning. Gaining insights from campus leaders, faculty, and students could help promote the success of ePortfolios as a mechanism for student learning and program assessment (Reardon & Hartley, 2007; Reardon, Lumsden, & Meyer, 2005; Rhodes, 2008). In order to focus students on their General Education requirements, instructors should use course syllabi to describe specific class assignments that might be related to the General Education competencies (Eberly, Newton, & Wiggins, 2001; Garavalia et al., 1999; Parkes & Harris, 2002).

Ahn (2004) describes benefits provided by ePortfolios: promoting university-wide establishment of education goals and expectations, providing students with opportunities to reflect on their learning, and giving instructors the ability to give feedback on student work and progress. A study by Reardon et al. (2005) examined the usefulness of ePortfolios to employers, who endorsed the idea of ePortfolios and agreed that "access to information about students' employability skills would be useful" (p. 371). Employers also identified eight skills that were necessary in the working world: communication, creativity, critical thinking, leadership, life management, social responsibility, teamwork, and technical/scientific skills. Thus an ePortfolio that highlights these skills may be used to help students obtain employment. In another survey of employers (Ward & Moser, 2008), 16% report that they use ePortfolios in initial screenings and 56% indicate they would like to use them in the future. When asked about what would be found in student ePortfolios, responses included: "Resumes/references (93 percent), Written work (39 percent), Projects (37 percent), Presentations (33 percent), Lesson plans (23 percent), Case studies (7 percent), Artistic performances (6 percent)" (Ward & Moser, 2008, p. 13-14).

The study presented here was designed to reveal how faculty and students might be using syllabi to address the new General Education and ePortfolio

requirements. To access that information, a survey of undergraduates was constructed to provide their perspectives on both Gen Ed and the use of ePortfolios. Our goal is to provide data for faculty and administrators interested in combining ePortfolios with academic requirements like Gen Ed to guide the use of syllabi for instruction on their campuses (Eberly et al., 2001).

The ePortfolio Program

The revision of the General Education curriculum at Clemson University in 2004 coincided with a campus-wide requirement for students to own and use laptop computers. Deliberations among faculty designing new curricula included discussion of the appropriate use of computers in the learning process and how the university community might capitalize on unique opportunities afforded by universal computer ownership by the student body. A recent accreditation reaffirmation from the Southern Association of Colleges and Schools (SACS) injected these discussions with ideas concerning assessment and the need for a move toward the use of student learning outcomes for program assessment. In addition, recent national recognition for incorporation of communication across the curriculum (CAC) efforts encouraged faculty to consider the use of electronic portfolios as a mechanism to document student achievement and create a new assessment window for program improvement. Several CAC faculty were experienced with the use of ePortfolios.

After some technical and philosophical evolution, the campus now uses an approach to ePortfolios that provides both flexibility for students and dependable data collection for assessment. Students may use any available ePortfolio platform they wish, although training is provided for creation of ePortfolios using Google Sites (sites.google.com). Other platforms seen in use by students include Weebly (www.weebly.com) and Wix (www.wix.com), and some students build websites using their university allotted server space. Use of platforms like Google is encouraged so that students can have transportability of their work beyond graduation and so that they may control access to external viewers. Training focuses on the basics of what an ePortfolio should contain, but students are at liberty to be as creative as they wish. Yearly ePortfolio award winners tend to have well developed sites that include personal, academic, and career materials. Some students report using their ePortfolio in job application, but that is not a primary intent conveyed to students in training materials.

In order to collect data on student work deposited in ePortfolios, a system was created to allow students to tag artifacts to the General Education competencies. In the CUePort system a student indicates documents that meet the Gen Ed competencies and writes a short rationale statement to describe why each artifact is an appropriate example of their understanding of that learning outcome. A copy of the artifact is stored on a secure campus server. Faculty and trained student assessors (e.g., members of undergraduate research teams) score artifacts in CUePort using established faculty-created rubrics; up until the time of graduation students have the ability to replace artifacts in the tagging system in the event that the score indicates a poor match to the competency. Final judgment of the tagged items is in the hands of faculty participants in the ePortfolio program, and students who fail to meet the established standards are prohibited from graduating. Finally, during a weeklong summer assessment meeting, a consortium of faculty review samples of work submitted by recent graduates. The results of these reviews are used to revise General Education requirements and to provide programmatic feedback to departments teaching the Gen Ed courses.

Students can learn about Gen Ed competencies in the printed undergraduate catalog, in the online catalog, on the Gen Ed website, on the ePortfolio Program website, and in the ePortfolio tagging tool system itself (CUePort). Students receive multiple reminders from the ePortfolio Director about starting, managing, and completing their ePortfolios.

Research Methods

As a way to become more familiar with syllabi across all subject areas, sample syllabi submitted to the university General Education Syllabus Inventory were analyzed. The Office of Assessment created the Inventory in an attempt to document which Gen Ed competencies were covered in which courses. Following the research interests of the team, every Gen Ed course in science, mathematics, and STS was sampled. Syllabi were evaluated based on parameters set forth in the requirement memo sent to faculty from the Dean of Undergraduate Studies at the beginning of each semester, which details syllabus requirements such as absence policy, integrity policy, topical outline, evaluation criteria, etc. All instructors are expected to utilize this memo in planning their syllabi and to adhere to the list of required components. Several syllabi were reviewed to identify the required elements as well as the extent to which syllabi included information about General Education. A simple yes/no rubric was applied to each item to indicate how well a sampled syllabus covered the requirements.

This preliminary data were used to establish a basic understanding of the variety of instructor approaches used in course syllabi, including how information pertaining to Gen Ed ePortfolios was incorporated.

Survey questions were generated in order to collect feedback from undergraduate students using the web tool Survey Monkey (www.surveymonkey.com), and all undergraduates were contacted by email and asked to participate in this survey anonymously. No incentive was offered for participation. Over a two-week period just prior to final exams, 984 survey responses were collected from an undergraduate population of approximately 14,000 students. Demographics of the response group very closely matched gender, class level, and major of the general undergraduate population. The free response answers were coded (Saldaña, 2009) for similarities and collated for group analysis by the research team.

Survey Results

According to results from the student survey, a large majority (80%) of students indicated that they consult their class syllabi at least once a week (Table 1). A study by Becker and Calhoon (1999) showed that students' attention to syllabi dwindles as the semester progresses; therefore, it is important that all critical information for the class be placed in the syllabus so that students can focus on these points early in the semester. Most Clemson students (87%) see the syllabus as a positive and necessary aspect of a course that is a key ingredient for success. Despite the importance of syllabi shown through the survey results, 80% of students report having had a syllabus that did not meet their expectations or was not useful in helping them to succeed in class. This aligns with results found by Habanek (2005), where a minority amount of the syllabi studied met necessary requirements to be considered effective. As indicated by 95% of the students in our survey, syllabi are important for planning and should include items such as specific test dates. This is consistent with the results of Becker and Calhoon (1999), which indicate that when considering their syllabi, students attend most to dates of exams and assignments.

Students were asked to evaluate the contents of their current syllabi (Table 2). Despite being a requirement for Clemson students since fall 2006, only 59% of students responded that General Education competencies are included in their syllabi, and only 51% responded that they wanted to see General Education competencies included. This result might be due to lack of concern or awareness by both faculty and students. When Gen Ed guidelines are not included in syllabi, students are not likely "to be aware of the purpose or meaning of the course or the way in which the course contributes to an overarching educational program" (Eberly et al., 2001, p. 70). Many of the components that Clemson students expected to be included in their course syllabi are also listed as suggested items by Garavalia et al. (1999).

Students who entered Clemson University in fall 2006 or later are required to tag artifacts in an ePortfolio as appropriate representations of competencies set forth in the General Education curricula. The responses in Table 3 were only collected from students with this requirement. While 65% of these students know which of their current courses are classified as Gen Ed, this is lower than would be expected, since all students must complete 30 credits of General Education. There is clearly a need to work toward a better understanding of which classes satisfy these credits and are thus connected to the ePortfolio requirement.

Despite significant efforts to communicate with students about their Gen Ed requirements, only 41% of students report that they are aware of services available for help with ePortfolios. Help is offered online and in person through the ePortfolio Program, but awareness needs to be increased within the student population so that these avenues may be utilized. There appears to be some apprehension among students about ePortfolios; this is evidenced by the 75% who do not see the benefit of this requirement. Unfortunately, a majority of students (60%) are not in favor of having a required class dedicated to help them design their ePortfolio. As a compromise, the class required for all new students (i.e., LIB 100, Clemson Connect) has been modified to include online tutorials for constructing an ePortfolio.

Table 1
Syllabi Use

Occurrence	Response Percent
Daily	17.9%
Weekly	61.7%
Monthly	14.0%
Once or twice a semester	6.0%
Never	0.4%

Table 2
Typical Syllabi Content

Item	Response Percent
Contact information	98%
Academic integrity policy	97%
Office hours	97%
Grading policy	94%
Course description	93%
Class attendance policy	92%
Exam dates	86%
Important due dates	86%
Exam make-up guidelines	67%
General Education competencies	59%
Page numbers of specific readings	52%
List of assigned homework problems	46%

Table 3
General Education Awareness

Item	Strongly Disagree/Disagree	Agree/Strong Agree
I know which of my current classes meet General Education requirements	35%	65%
I am aware of services to help me with my Gen Ed ePortfolio	59%	41%
I think that the Gen Ed ePortfolio will be beneficial to me in the future (e.g., job interviews, graduate school applications)	75%	25%
I would like to have a required class specifically designed to help me create my ePortfolio	60%	40%

Table 4
Question: Where do you go to get help with ePortfolio?

Response	Response Percent
I haven't started yet	43.9%
Blackboard	30.1%
I need help but haven't asked yet	29.1%
Course instructor	24.2%
Friends	21.2%
Academic advisor	8.7%
Campus IT website	7.4%
Class of 1941 Studio for Student Communication	5.5%
I never need help	5.5%
Course syllabi	4.2%
Course teaching assistant	3.0%

A question was included on the survey that asked, "Where do you go to obtain help with your ePortfolio?" Students were allowed to select all responses that applied. The data are summarized in Table 4. Unfortunately, the most frequently selected response (44%) was that most students have yet to start work on their ePortfolio. Students might be procrastinating because their graduation is a few years away and their ePortfolio is not high on their priority list. Almost a third of the responses (30%) indicate that students refer to their Blackboard home page for help. Blackboard is the classroom management system used at Clemson to connect instructors and students online (e.g., documents, discussion boards). The magnitude of this

response is somewhat unexpected since there is not much material related to ePortfolio available on Blackboard. About as many students (29%) have yet to seek help on the completion of their ePortfolios, which may indicate that either these students are not doing their ePortfolios or do not know where to begin.

Only 5.5% indicate receiving help at the Class of 1941 Studio for Student Communication (a campus multifunction communication facility). Student assistants are available at the Studio Monday through Friday from 9:00 a.m. to 5:00 p.m. to help students with their ePortfolios and communication skills in general. The number of students that report receiving help at the Studio is surprisingly low considering that this site is centrally located and designated to help students with their ePortfolios. Even a visible campus resource can go un-noticed by students, so it is clear that improvements are needed to educate students about where to go for help. The program administrators might improve things by expanding online technical support to help students in need (Waters, 2007). Students are not always technically savvy and this could aid students in the design and creation of their ePortfolio, as well as helping them solve technical problems they might encounter.

Survey Comments on Syllabi

A free response section in the survey was included to further document students' thoughts on syllabi. The question was posed as "What changes would you like to see made in class syllabi?" Of the coded responses, 60% indicated that their class syllabi should be more detailed (Figure 1). Students indicate that syllabi should include items such as exam dates, assigned homework problems, pages for reading material corresponding to class sessions, Gen Ed competencies, project outlines, and Supplemental Instruction (i.e., peer tutoring) information where applicable, which align well with the suggestions of Leeds (1993). These results are similar to those from a study done in an introductory Psychology class where the items on the syllabus that students pay the most attention to were found to be exam and quiz dates, due dates of assignments, and reading material covered by an exam or quiz (Becker & Calhoon, 1999). The findings from this investigation are also similar to those in a study, which found that students would prefer more rather than less in their syllabi (Habanek, 2005). Baecker (1998) found that syllabi are often drafted without the author paying attention to the language and the meaning of the directions and information contained in them. This is consistent with our results corresponding to the next highest percentage of coded responses (25%), which demonstrates concern about overall syllabus format. Student comments indicate a lack of consistency among

classes—some professors change exam dates frequently whereas others fail to list exam dates. According to Parkes et al. (2003), it is important that syllabi be consistent in order to be most effective.

The free response section also posed a more general question: "Do you have any other comments about class syllabi?" Student responses voiced an additional concern about access to syllabi. Students suggest that a copy of all class syllabi should be posted online in any of a variety of ways. This indicates that most students are not aware of the campus Syllabus Repository, so this resource needs to be better advertised. Another common response was to make syllabi more concise because if they are too long students may experience an "information overload" (Keller, Marcis, & Deck, 2008, p. 13). This is somewhat inconsistent with a previous finding that students wish syllabi to be more detailed—indicating that students seek a balance between detail and brevity. A syllabus needs to have as much helpful information as possible, even if that means it is long, but the information should be in the simplest format possible with avoided redundancies (Garavalia et al., 1999).

ePortfolio Comments

Responses to a question requesting feedback on the use of ePortfolios were collected only from students who indicated that they must complete an ePortfolio based on their semester of entry. In the ePortfolio free response section of the survey, students were asked the question: "What changes would you like to see in class syllabi concerning Gen Ed or Gen Ed ePortfolios?" The main concern identified was availability of a list of specific assignments that could fulfill the requirements for the different Gen Ed competencies (38%). This issue could best be resolved by minor adjustments to syllabi. The second highest response (19%) was to eliminate ePortfolios altogether. Students indicate that they would like to understand more clearly the rationale behind Clemson's ePortfolio requirement and how it will impact their career. Additional responses indicate the need for more help and information about Gen Ed ePortfolios because of apparent confusion over the resources available.

Nevertheless, in the present survey, some students do indicate that they are getting instruction on how to complete their ePortfolios. Slightly over 25% of all respondents had at least one class where ePortfolios were covered, and over 10% had instruction in two courses. Student responses indicate they were receiving useful instruction on ePortfolios in a college skills course, an introductory composition course, an introductory engineering class, an engineering fundamentals course, and an introduction to Biological Sciences course. Programmatically, we believe students

Figure 1
Suggested Improvements for Class Syllabi
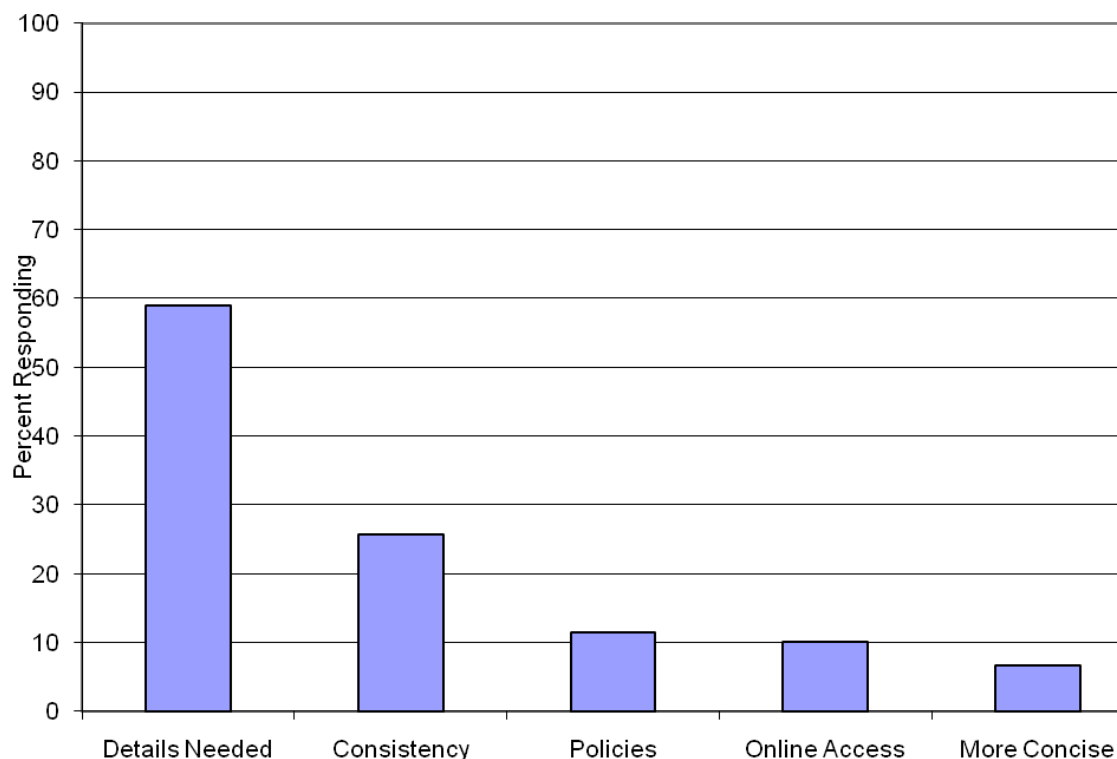
should encounter ePortfolio instruction as much as possible, so having a footprint in these introductory courses is a benefit.

Discussion

Syllabi are positive features of courses used on a routine basis by most students. They are necessary for student success, yet some attention to their design is required to insure effectiveness. Suggested improvements include increasing syllabus details and providing consistent syllabi for all courses. Availability of online syllabus templates has been explored because it was thought this would help standardize syllabi and make it easier for instructors to manage and edit syllabi (Abdous & He, 2008). Unfortunately, results of this approach indicate that even when given a template, a majority of faculty still created their syllabi from scratch, suggesting that faculty prefer to have control of syllabus design. It appears that if stricter guidelines are put into effect to standardize syllabi, faculty behavior should be considered when developing the message to campus.

Syllabi can help students become better learners if they focus on the student, what he or she needs to do to

prepare for the class, and how to study efficiently (Parkes & Harris, 2002). Faculty may not feel the need to remake syllabi every semester, which may be especially true for General Education courses (Eberly et al., 2001). This behavior was evident in our former syllabus repository and may be a contributing factor to why a majority of students (86%) do not report using it. A more robust syllabus repository has been created, one that is easy to use by both faculty and students, and one that is frequently updated and monitored.

The new syllabus repository has several features that should improve communication between faculty and students. Faculty upload syllabi for their courses in current and future semesters, or they may designate other department personnel to perform the task. Departmental coordinators have administrative access to identify which courses provide opportunities for students to satisfy specific Gen Ed competencies and generate artifacts for their ePortfolios. Students may search the database using categories including course, course level, instructor, Gen Ed competency, or keyword (provided by faculty at the time of upload). Because of the variety of features, this application should become well used by students as both a planning tool and a convenient way to access current

information. The address for the repository is www.clemson.edu/syllabus/.

Clemson's ePortfolio program is advertised as easy and helpful for documentation of student learning, but presently many students don't see the ePortfolio requirement as a benefit. Although not directly reflected in the data presented here, there was a general sense of confusion about ePortfolios during the early years of implementation. Students seeking help have reported that faculty teaching General Education courses were not focused on the ePortfolio, leading to many interpretations of what students should be doing. Students exhibit differential acceptance of the use of ePortfolios for Gen Ed assessment and for career planning: neither goal resonates with all students.

In a study in which a university implemented an ePortfolio program, a key to the success of the program was the high-level administrative support, for example by the president of the university (Reardon et al., 2005). For student use of ePortfolios for documenting Gen Ed to be effective at any university, there needs to be a wide range of support in many different groups on campus, most importantly by faculty and staff. Our results suggest that faculty should re-evaluate methods of encouraging students to complete their ePortfolios, including emphasizing ePortfolios in syllabi and discussing them in class. In order to accomplish this, faculty must be better informed about Gen Ed competencies and the role of ePortfolios in their assessment, and students need clearer information about enforcement of ePortfolio requirements.

Results of the present study should encourage new conversations about Gen Ed requirements, and may help others that are considering the use of electronic portfolios as an assessment strategy. Effective communication about the expectations contained within syllabi, and the critical role that syllabi can serve in promoting the learning process is important for any higher education environment. Class syllabi represent the simplest and most direct form of communication about the curriculum to our students, and as such deserve adequate attention from all campus stakeholders.

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Acknowledgements