



IJeP

International Journal of ePortfolio

Volume 8 • Number 1 • 2018

ISSN 2157-622X



A Publication of the
Association of American Colleges and Universities

Executive Editors

C. Edward Watson

Director, Center for Teaching and Learning
University of Georgia, Athens, GA, United States

Helen L. Chen

Senior Researcher, Designing Education Lab in the Center for Design Research
Stanford University, Stanford, CA, United States

Tracy Penny Light

Executive Director, Centre for Student Engagement and Learning Innovation
Thompson Rivers University, Kamloops, British Columbia, Canada

Associate Editors

Andrew Albenesius

Assistant to the Director, Center for Teaching and Learning
University of Georgia, Athens, GA, United States

Jessica Chittum

Assistant Professor, Department of Elementary and Middle Grades Education
East Carolina University, Greenville, NC, United States

Christy Desmet

Professor, Department of English
University of Georgia, Athens, GA, United States

Senior Advisor

Peter E. Doolittle

Director, School of Education
Virginia Tech, Blacksburg, VA, United States

Editorial Board

Trent Batson, *Retired*, United States

Gerd Bräuer, *University of Education / Zurich University of Applied Science*, Germany & Switzerland

Gary Brown, *Association of Authentic, Experiential, and Evidenced-Based Learning (AAEEBL)*, United States

Darren Cambridge, *American Institutes for Research*, United States

Shelley Johnson Carey, *Association of American Colleges and Universities (AAC&U)*, United States

Susan Clark, *Virginia Tech*, United States

Bret Eynon, *LaGuardia Community College*, United States

Wende Garrison, *Portland State University*, United States

Simon Grant, *University of Bolton*, United Kingdom

Wendy Harper, *Queensland University of Technology*, Australia

Kate McConnell, *Association of American Colleges and Universities (AAC&U)*, United States

Allison Miller, *Australian Flexible Learning Framework*, Australia

Terrel L. Rhodes, *Association of American Colleges and Universities (AAC&U)*, United States

Marij Veugelers, *Universiteit van Amsterdam*, Netherlands

Ruth Wallace, *Charles Darwin University*, Australia

Kathleen Yancey, *Florida State University*, United States

Affiliates of the *International Journal of ePortfolio*

Association for Authentic, Experiential and Evidence-Based Learning (AAEEBL)
ePortfolio and Identity Conference

Manuscript Review Board

Nate Angell, *rSmart*, Scottsdale, United States
 Igor Balaban, *University of Zagreb*, Croatia
 S.R. Balasundaram, *National Institute of Technology*, India
 Lee D. Ballantyne, *City of Glasgow College*, United Kingdom
 Helen Barrett, *Electronic Portfolios and Digital Storytelling to Support Lifelong and Life Wide Learning*, United States
 Linda Bastone, *Purchase College, State University of New York*, United States
 Lisa Bolding, *Oxford College at Emory University*, United States
 Gerd Bräuer, *University of Education / Zurich University of Applied Science*, Germany & Switzerland
 Eileen Brennan, *Mercy College*, United States
 Gary Brown, *Association of Authentic, Experiential, and Evidenced-Based Learning (AAEEBL)*, United States
 Rachel Challen, *Loughborough College*, United Kingdom
 J. Elizabeth Clark, *LaGuardia Community College - CUNY*, United States
 Kirstie Coolin, *University of Nottingham*, United Kingdom
 Ruth Cox, *San Francisco State University*, United States
 Steve Culver, *Virginia Tech*, United States
 Elizabeth Davis, *University of Georgia*, United States
 Christy Desmet, *University of Georgia*, United States
 Claudio Diaz, *Universidad de Concepción*, Chile
 Stephen Ehrmann, *University System of Maryland*, United States
 Teddi Fishman, *Clemson University*, United States
 Yitna Firdyiwek, *University of Virginia*, United States
 Pamela Frazier, *Radford University*, United States
 Laura M. Gambino, *Stella and Charles Guttman Community College*, United States
 William Goettler, *Yale University*, United States
 Lynne Groves, *Minnesota State Colleges and Universities*, United States
 Milton Hakel, *Bowling Green University*, United States
 Alexis Hart, *Allegheny College*, United States
 Corey Hickerson, *James Madison University*, United States
 Klaus Himpf-Gutermann, *Danube University*, Austria
 Megan Hodge, *Randolph-Macon College*, United States
 Ruth Hodges, *South Carolina State University*, United States
 Jayme Jacobson, *University of Idaho*, United States
 Susan Kahn, *Indiana University - Purdue University Indianapolis (IUPUI)*, United States
 Sara Kajder, *University of Georgia*, United States
 Stefan Keller, *University of Applied Sciences Northwestern Switzerland*, Switzerland
 Khusro Kidwai, *Northwestern University*, United States
 Paul Kim, *Stanford University*, United States
 Michael LaMagna, *Delaware County Community College*, United States
 Romy Lawson, *University of Technology*, Australia
 Phil Long, *University of Texas at Austin*, United States
 Debbie Lord, *Central Piedmont Community College*, United States
 Jean Mach, *College of San Mateo*, United States
 Kyle Mackie, *University of Guelph*, Canada
 Jeton McClinton, *Jackson State University*, United States
 Kenyetta McCurty, *Amridge University*, United States
 Patricia McGee, *University of Texas at San Antonio*, United States
 Lisa McNair, *Virginia Tech*, United States
 Victor McNair, *University of Ulster*, United Kingdom

Julie Meek, *Indiana School of Nursing*, United States
Heather Moorefield-Lang, *University of South Carolina*, United States
Carlos Morales, *TCC Connect Campus, Tarrant County College District*, United States
Delia Muir, *University of Leeds*, United Kingdom
Christopher Murray, *University of Leeds*, United Kingdom
Nancy O'Laughlin, *University of Delaware*, United States
Julia O'Sullivan, *The Royal College of Surgeons of England*, United Kingdom
Judith Patton, *Portland State University*, United States
Tracy Penny Light, *Thompson Rivers University*, Canada
Clovis C. Perry, Jr., *Bluegrass Community & Technical College*, United States
Marlene Preston, *Virginia Tech*, United States
Candyce Reynolds, *Portland State University*, United States
Rich Rice, *Texas Tech University*, United States
Muhammad Safdar, *International Islamic University*, Pakistan
Ken Scott, *Amridge University*, United States
Uri Shafrir, *University of Toronto*, Canada
Ashfaq Ahmad Shah, *University of Sargodha*, Pakistan
Greg Sherman, *Radford University*, United States
Karen Singer-Freeman, *Purchase College, State University of New York*, United States
David Sowden, *University of Hull*, United Kingdom
Benjamin Stephens, *Clemson University*, United States
Teggin Summers, *Virginia Tech*, United States
Neal Sumner, *City University London*, United Kingdom
Tilisa Thibodeaux, *Lamar University*, United States
Paul Treuer, *University of Minnesota*, United States
Kam H. Vat, *University of Macau*, China
Paul Wasko, *University of Alaska*, United States
Jerry Whitworth, *Texas Woman's University*, United States
Marc Zaldivar, *Virginia Tech*, United States

IJeP

International Journal of ePortfolio

Volume 8 • Number 1 • 2018

Instructional Articles

“Reflecting on Reflections:” Curating ePortfolios for Integrative Learning and Identity Development in a General Education Senior Capstone 1-12

Thomas Schrand, Katharine Jones, and Valerie Hanson

Reflecting on Reflecting: Summer Undergraduate Research Students’ Experiences in Developing Electronic Portfolios, a Meta-High Impact Practice 13-25

Karen Weber and Keri Myrick

Assessment Article

The Theory-to-Practice ePortfolio: An Assignment to Facilitate Motivation and Higher Order Thinking 27-42

Jessica Chittum

Technology Article

Highly Structured ePortfolio Platform for Bachelor of Nursing Students: Lessons Learned in Implementation 43-55

Emma Collins and Ray O’Brien

Employer Perceptions Article

Employer Perceptions of an Engineering Student’s Electronic Portfolio 57-71

Karen Weber

Design Thinking Article

Manhattanville College’s Atlas Program: Designing a Road Map to Success in College and Beyond 73-86

Alison S. Carson, Gillian Greenhill Hannum, and Christine Dehne

“Reflecting on Reflections:” Curating ePortfolios for Integrative Learning and Identity Development in a General Education Senior Capstone

Tom Schrand, Katharine Jones,
and Valerie Hanson
Thomas Jefferson University

By embedding an ePortfolio process in a general education core that culminates with a senior capstone course, Thomas Jefferson University has created an opportunity for students to use their completed ePortfolios as archives of primary sources that they can curate to produce narratives about their intellectual development. The result was a capstone course with a level of integrative meta-reflection that allows students to select, rearrange, and narrate the contents of their ePortfolios as they reviewed and redefined their identities as learners, citizens, and future professionals.

Academic departments and institutions employ ePortfolios for a variety of purposes, ranging from assessment to integrative learning to job applications, with the ePortfolio serving both as the means to an end (intentional and reflective learning) and as an end in itself (a collection of student work for assessment purposes). But what if a student's completed ePortfolio was the starting point for a new cycle of reflection and integrative learning? Thomas Jefferson University has developed an ePortfolio process embedded in its general education core that culminates with a senior capstone course. Building this final reflective moment into the curriculum creates the opportunity for students to use their completed ePortfolios as archives of primary sources that they can curate to produce narratives about their intellectual development. The result is a capstone course with a level of integrative meta-reflection that allows students to select and rearrange the contents of their ePortfolios as they review and redefine their identities as learners, citizens, and future professionals.

ePortfolios at Jefferson

The Hallmarks Program for General Education was launched with the incoming class of 2014, after two years of cross-campus discussions and innovative design thinking exercises involving faculty, staff, and students. The aim of our general education reform was twofold: (1) to expand the parameters of general education to include learning experiences in the majors and the co-curriculum; and (2) to heighten campus-wide awareness and fulfillment of general education learning goals. With the encouragement of the Provost's Office to devote sustained attention to this reform process, and the engagement of large segments of the campus community in the development of the new curriculum, our faculty approved the revised general education program by a 70% vote (Schrand, 2016).

In its fourth year, the new initiative has been a comprehensive approach to general education centered

on an ePortfolio requirement and eight shared learning goals that are addressed not only in the core curriculum but also in the majors and co-curriculum (see Table 1). For students at Jefferson, assembling a general education ePortfolio was an ongoing, iterative experience that spans the three to five years of their undergraduate education. As students collected and archived samples of their academic work and documented their co-curricular experiences, they were presenting the artifacts as evidence of their progress towards the university's eight general education learning goals, making their case by writing reflective essays for each item that explained the context and discussed their work's connection to the selected goal (Schrand, 2016).

Instructors supported and reviewed this process of ePortfolio assembly and reflective writing in a sequence of required general education courses called “touchstones.” With one touchstone course in each year of the four-year core curriculum, students had multiple opportunities to update and advance their ePortfolios and to have them evaluated by a faculty member in the liberal arts. From the first touchstone course on, students practiced and improved their reflective skills, adding more artifacts to their ePortfolios each time and receiving formative feedback from instructors who used a shared set of writing prompts and a common rubric for assessing the reflective essays across the four touchstone courses. Instructors also assessed the completion of the ePortfolio, giving students insight into how they are developing the ePortfolio over time. This curricular architecture culminated in the senior year with a touchstone course called the Capstone Folio Workshop, which served as the capstone for the core curriculum and as a final review of the ePortfolio process.

With this approach to tracking general education learning goals through an ePortfolio system, our students systematically developed an archive of primary sources for building narratives about their education and their evolving identities. The earlier touchstone courses laid the groundwork for this culminating experience by introducing students to reflection through writing,

Table 1
Hallmarks Learning Goals

Learning goal	Definition
Curiosity (rigorous inquiry)	Create strategies for expanding knowledge through reflection and research.
Confidence (critical reasoning)	Challenge concepts, practices and experts with reasoning and evidence.
Contextual understanding (clear communication)	Develop and share insights using appropriate means of expression.
Global perspectives	Navigate diverse environments and complex issues by managing multiple systems of knowledge and behavior.
Empathy (social insight)	Consider multiple perspectives in order to relate to others and strengthen communities.
Collaboration (strategic teamwork)	Achieve goals by integrating skills and knowledge in a team setting.
Initiative (Intellectual Risk-taking)	Take creative and intellectual risks when exploring ideas and real-world problems.
Ethical reflection	Affirm an ethical compass to guide personal, civic and professional life.

supporting students in the reflective process, and providing moments of accountability that kept them on track in terms of assembling all of the required artifacts. When they arrived in the capstone course, they had a rich collection of evidence of their learning, not only from their general education requirements but also from the courses in their majors and their co-curricular experiences.

Reflection and Integrative Learning

This accumulation of artifacts and the design of our curriculum and ePortfolio process set the stage for a meaningful advancement of integrative and reflective learning in the senior year. Reflection, according to Yancey (2009), is a gateway to deep learning, and she emphasized the importance of academic structures that encourage this type of meaning making. Yancey (2009) defined reflection as the product of “reiterative processes” (p. 14) and asserted that the compilation of a robust ePortfolio creates the preconditions for students to revisit and reinterpret their educational milestones with new knowledge and insights. Both Yancey (2009) and Nguyen (2013) cited the social nature of ePortfolio building as one of the features that accounts for its impact. Nguyen (2013) presented the ePortfolio as a site where “students may continually re-articulate their ideas of self to others” (p. 135), while Yancey (2015), like Dewey (Rodgers, 2002), disputed the notion that reflection is “an individual process,” arguing instead that it requires “the context of others for the making of meaning” (Yancey, 2015, p. 189), a context that is established in curricular ecosystems that include ePortfolios.

Researchers also put forth ePortfolios as a site of identity building for students. Rowley and Munday (2014) described how the reflective work of assembling an ePortfolio can help students develop “a sense of self,” which they considered “the most valuable outcome of an ePortfolio” (p. 79). This conforms to Yancey’s (2009) assertion that the kind of reflective thought inspired by ePortfolio compilation “fosters the identity of a learner” (p. 14). For Reynolds and Patton (2014), identity development is the highest stage of the integrative learning that ePortfolios can inspire. Nguyen (2013) perceived ePortfolio work as creating “a sharable narrative of identity” in which students “viewed their past in new ways and expanded on the imagined future” (p. 141). Buyarski et al. (2015) linked the ePortfolio process to self-authorship, describing it as “an inherently social process” (p. 286). The identity formation effect of ePortfolio practices seems, in these accounts, to be connected to the narrative impulse prompted by collecting artifacts and explaining their context.

In addition, ePortfolios have been frequently promoted as a means towards achieving integrative learning (Peet et al., 2011; Reynolds & Patton, 2014). According to Reynolds and Patton (2014), an ePortfolio program should include four distinct elements in order to deliver truly integrative learning: artifacts of learning, reflections on those artifacts, evidence of students making connections between the different artifacts, and efforts to connect the ePortfolio contents and the student’s own identity. As we revised our general education curriculum to include an ePortfolio

component, we realized that we had explicitly addressed the first two elements, but were only implicitly addressing the last two. Given the importance of curricular scaffolding to support the complex task of integrating knowledge (Kinzie, 2013), we turned to our general education capstone course as a likely space to create such support. Having addressed at least the first two conditions for integrative learning in the early stages of our curriculum design, we saw the capstone as a chance to reach the second two: as the students' ePortfolios neared completion, could further cycles of reflection within the capstone help them to make connections between their different artifacts, and allow them to find the connection between themselves and the contents of their ePortfolios that would promote identity development?

The ePortfolio Senior Capstone

The first task of the senior capstone at Jefferson was to assist students in completing their ePortfolios, both by selecting artifacts and writing the reflective essays that accompany them. These class sessions were run partly as an interactive studio, with instructors going from student to student to help them think through how their work over the past years meets the eight learning goals. As their ePortfolios near completion, the students proceed to reviewing their materials, which has lead them to the third step towards integrative learning identified by Reynolds and Patton (2014): building connections between different items in the ePortfolio.

To guide students in the reflective work of connection-making, the capstone course used assignments that invited them to "curate" selected items from their ePortfolios. Just like a museum curator, they decided how to frame, label, and organize relevant items from their ePortfolio. This initial curatorial assignment, known as the "disciplinary snapshot," asked students to reflect on their lives as thinkers and learners. In a short paper, they considered why they had chosen their major, what was interesting or important to them about it, and how five artifacts from their folio reflect their identities as professionals. This assignment asked them to develop connections between their artifacts (both in their major classes and in their general education classes) and to consider how the knowledge, skills, and values they developed as a professional would be helpful to them in the future (see Appendix A). Thus, they began to conceptualize their folio as formative of their identity as a practitioner of their discipline, in particular how their learning helped them to make sense of the world. By asking students to consider how they plan to use their disciplinary knowledge in the future, we explicitly required them to link their major to real world problems that they were

interested in solving once they left the university, encouraging reflection on their "imagined future" (Nguyen, 2013, p. 145).

The second curatorial assignment was aligned with the academic content of the course: citizenship. Using a variety of readings and texts, the course built towards the second assignment as the class examined citizenship at different scales: local, national, professional, university, and global. For example, watching a film like *Salam Neighbor* (Khattab, Darwaza, Ingrassi, & Temple, 2016) encouraged students to consider not only their ideas about refugees who have fled violence in Syria but also what it means to be a global citizen in a world where refugees are not treated as neighbors. How might our general education learning goals, such as empathy, ethical reflection, rigorous inquiry, and global perspectives, be important to how students understand the history of refugees and countries' willingness or unwillingness to help them? Likewise, using citizenship as a lens to discuss a reading that interprets residents' responses to the Love Canal crisis of the 1970s and connects it with anti-refugee rhetoric towards "boat people" (Cuban, Vietnamese, Laotian, and Cambodian refugees) helped students to think about the role of health, the environment, and racism in definitions of citizenship (Thomson, 2016). We could then discuss the competing discourses of citizenship: Does global citizenship outweigh local citizenship or vice versa? What did we learn about definitions of US national citizenship during that time period? How important are citizenship rights versus citizenship responsibilities?

As they confronted these topics and questions, students began to expand their ideas of their place in the world through the lens of citizenship; they also started to reconsider their university education in activist terms as they reflected on how their education has served them and how they could use and develop that education to engage with the world. Our eight learning goals cropped up again and again as we engaged with these texts and, as a class, developed our understanding of the connections between them when applied to citizenship. Indeed, reviewing our eight learning goals in class alongside a reading from the National Council for the Social Studies suggested that all of these goals could be aligned with the requirements of active citizenship (National Council for the Social Sciences, n.d.).

This academic content brought the class to a second assignment that required them to curate their ePortfolio materials, this time to tell a story about their citizenship journey (see Appendix B). The assignment stipulated the selection of five artifacts, requiring that at least one artifact be from the general education core, at least one from their major; we also encouraged them, if possible, to choose one from their co-curricular activities. Students presented their curated folio to the whole class (which provided the social context for their identity formation),

explaining how they now understand the various locations of citizenship and how they see themselves in relation to these enhanced understandings of citizenship. This allowed them to develop their own model of citizenship based on their experiences during their college years. Some students even suggested that it enabled them to create their own “personal brand” and define which aspects of their college career they wanted to stress as they left the university.

An initial review of student work from the second curatorial assignment indicated that students were beginning to articulate connections between their artifacts and that citizenship has been a useful site from which to define different aspects of their identities. For instance, a Fashion Design student created a connection between citizenship and the learning goal of empathy early in his script for his final curation project:

I feel that my citizenship has started very broad, with a basic understanding of cultures, but over time, I have been able to be an active participant regarding empathy, and understanding the value of empathy when it comes to citizenship.

He then explained how empathy went “hand in hand” with two of the other learning goals, “critical reasoning, and contextual understanding,” as he considered a paper that he had written in a course in his major about pollution and waste in the fashion industry:

I thought about how it seemed that the areas they put plants . . . are lower income areas. Additionally, when companies outsource, we are basically paying people less and polluting that countr[y’s] water source. It just seems so wrong. One little way I felt like I could help was during my Problem Solving class. In this class, we were to create 4 garments in total from recycled and repurposed materials. If more people did this, I think all the waste saved and being reused would make some type of impact globally, even if it is small.

An Industrial Design student was able to see a co-curricular activity she wrote about in her folio as evidence of her developing identity as an engaged professional:

When it comes to professional citizenship, there are many issues within industrial design, but one I can particularly empathize with is sexism . . . For my Confidence learning goal, I chose an artifact that depicted sexism, and potential ways to overcome it. I went and spoke to a group of girls about overcoming sexism, and to not let any negative outlooks or opinions deter them from doing what they wanted to do... The artifact challenged me to become an activist, and showed me that I can take

part in changing such a huge issue. Another characteristic of an effective citizen is participat[ing] in civic and community life. After understanding and learning about cultures of other countries [and] past events . . . I was now able to actually help my community physically. This was my first step in understand[ing] what it means to be a citizen at a hands-on level, and the result was rewarding. I hoped to educate these young girls... and prepare them to change the future of citizenship.

Here we see the student narrating the ways in which she combined the idea of citizenship with her own activism for social justice. In the class discussion after her presentation, she revealed that her career plans had changed as a result of the class: she no longer wanted to focus on designing luxury handbags but was seeking a way to make a more tangible and positive difference in the world through her design work.

Another Industrial Design student was more explicit about the development of his professional self as a result of consideration of the Ethics learning goal:

Ethical Reflection for a designer means to understand the broader impact of each decision you make. As a global and professional citizen, designers have a responsibility to the health of the environments we live in, and therefore the health of other citizens as well. I chose to use my Design 4 Lighting Project from sophomore year to showcase my growth as designer that understands how material choice affects the carbon footprint of every single product.

A Community and Trauma Counseling student illustrated how the concept of identity intersected with the various ideas of citizenship we discussed in class to illustrate how her journey of self-discovery needed to be ongoing:

This concept of citizenship is something [that] shifted greatly this semester as the readings provided deeper understanding and context to the issues surrounding citizenship. I think that a person’s understanding of citizenship is something that should change and grow throughout their life . . . Moving forward, after this class I would like to continue this journey through citizenship, particularly in regards to professional citizenship . . . I think it is important to continue to study citizenship, and challenge my beliefs in order to grow, [especially] as I begin a career in mental health counseling.

In their presentations, these students identified themselves as agents who had the ability to act on the world. As this initial analysis has shown, reflective

curatorial assignments in the capstone helped them take ownership of the ideas of citizenship and civic engagement and thus prepared them to become democratically engaged and to think ethically about their future role as professionals.

Curating and Narrating to Define Identities

Thanks to the reflective opportunities that the capstone course provided as students completed their collection of artifacts, our ePortfolio process featured two important recursive dynamics that elicited deepened reflection and metacognition. The first was that students were required to present at least two artifacts for each general education learning goal: one from their work in the core curriculum and another from relevant work in their majors. This forced them to revisit and reconsider the learning goal at two different points in their education from two different disciplinary contexts. The second recursion came in the senior capstone, when the students returned to their archived artifacts and reviewed them to find primary sources that could anchor a narrative about their personal development. This revisiting of the learning goals and then of their earlier artifacts and reflective essays created space for deep learning and self-definition, as prescribed by Yancey (2009): “[r]eflection comes in . . . reiterative processes; building in reiteration explicitly builds in time, which in turn fosters the identity of a learner” (p. 14). This identity-building activity, what Rowley and Munday (2014) referred to as the development of an “‘ideal self’ as a professional practitioner” (p. 84), drew explicitly from classes in their major, co-curricular activities, and the core general education curriculum, and allowed for integration of learning across what are often seen by students as separate categories. Our program for general education explicitly and ambitiously highlighted how general education skills were developed across all parts of a Jefferson student’s education. Because the resulting ePortfolios contained artifacts from the majors and the co-curriculum, our general education capstone allowed students to think beyond their general education class experiences and to identify moments within other experiences that connected to the larger learning goals.

In the case of the capstone course, the identity of a learner was addressed directly in the curation assignments that used the ePortfolio as an archive of primary sources documenting the student’s journey. The requirement to forge coherent narratives from these materials provided an opportunity lacking in most curricula for students to think explicitly about the arc of their educational development. As Nguyen (2013) observed for ePortfolios as a whole, curation assignments allow students to “re-articulate their ideas of self to others, bringing about new understandings and ethical

intentions” (p. 135). When compelled to look back purposefully on their previous experiences to note and identify the key moments and gradual advances in their learning and skill building, students were able to transform “discordance in life to concordance in narrative” (Nguyen, 2013, p. 141) as they observed or created patterns within their past experiences.

Unlike the ePortfolio programs reviewed by Landis, Scott, and Kahn (2015), our Hallmarks Program intentionally highlighted reflection as a metacognitive exercise from the start. Like these other programs, we have been surprised by the limitations in our students’ abilities to think reflectively and have taken significant steps to support their development in this area (Morreale, Van Zile-Tamsen, Emerson, & Herzog, 2017). To reinforce best practices and to ensure consistency across the sequenced touchstone courses, we have revised our writing prompts for the reflective essays and deepened the questions we ask students to answer in their reflections. All instructors use the same set of writing prompts to help students structure their reflective essays, along with a corresponding rubric for evaluating the essays.

As our seniors completed their ePortfolios and turned to the task of curating and connecting their contents, they began to identify the patterns and key moments that had shaped their university education. Our two reflective, meaning-making assignments established a context within which students could begin to clarify and articulate their identities. Taking into account Kinzie’s (2013) argument that integrative experiences should not be reserved for the capstone course because integrating one’s learning is such a complex task, these assignments built upon previous work on the process of reflecting (as a Graphic Design student said, with some frustration, “You are asking us to reflect on our reflections!”). With its senior capstone, our general education program provided the curricular space and accumulated artifacts that made this final integrative move possible.

As of now, we are still in the early stages of delivering our integrative ePortfolio capstone, and we continue to think about how to use the student artifacts during class activities to make the connections between our eight learning goals more explicit in relation to the items in their ePortfolios (and hence, to their prior learning). Our experiences so far suggest the need to continue to find ways to encourage sometimes-reluctant students to find intrinsic value in deeper and more meaningful levels of reflection and connection. With the capstone theme of citizenship, we frame identity not just as an individual path but also as the connection between an individual and their place in the world, inviting our students to see themselves as active agents who have the skills and knowledge to make a difference in the world, both as professionals and as citizens.

Viewing the New General Education Curriculum From the Senior Capstone

Rolling out this ambitious new approach to general education presented a series of challenges and setbacks as well as successes, and it has been gratifying and enlightening to reach the senior year with the initial cohort of students. Following faculty approval of the new program in the late fall of 2013, the implementation was pushed ahead for the next academic year, which negatively affected the curricular experience of the first students. There were significant gaps in terms of faculty development around the new program and consistent messaging about its structure and rationale. We also encountered problems with the configuration of the ePortfolio platform, which delayed student access to the system and provoked some frustration and alienation among both students and faculty. As the rollout progressed, we have been able to address some of these issues so that subsequent cohorts have advanced more smoothly through the process.

Given the novelty and scope of the new curriculum, we initiated systematic assessment from the end of the first academic year. Our annual assessment process recruited two faculty members from each of the university's colleges, creating a team that spent three days reading and scoring a representative sample of student ePortfolios, focusing on their entries for two of the eight learning goals each year, for a four-year cycle. In the first year of assessment, our team could review only the ePortfolios of first-year students, and we have been tracking this cohort each year as the most senior class in the program. By reporting our annual findings to the first university faculty meeting each year, we were able to draw faculty attention to issues of common concern and raise awareness of both the contents of the curriculum and our students' levels of achievement in relation to the learning goals.

The entry of this initial cohort into the general education capstone course was a fascinating and sometimes humbling opportunity to test the abstract aims of the program against students' lived experience and actual results. In too many cases, students arrived in the senior capstone with ePortfolios that were lagging far behind the expected state of completion, and some students still showed confusion or skepticism about the purpose of assembling an ePortfolio and reflecting on its contents. Identifying the appropriate content and activities for the capstone also proved difficult, with some students complaining about more academic work in addition to the work of assembling missing artifacts and writing or improving their reflective essays. In response to student feedback, the capstone is now being revised to free up more time for working on the ePortfolio during class time while still developing an academic understanding of the

relationship between the learning goals and citizenship. We are also orienting reflective work towards post-graduation planning and helping students to fine-tune their professional personae in preparation for job applications and interviews.

The view from the capstone revealed and highlighted shortcomings in earlier levels of the curriculum, which could be discouraging but provided insights that were not available earlier in the implementation process. These findings inspired a variety of initiatives, from faculty workshops devoted to specific learning goals, such as collaboration, to the development of a detailed and common rubric for assessing reflective essays, which was distributed to all instructors in the touchstone courses as well as the faculty at large (see Appendix C). Faculty at other institutions who are embarking on a revision of their general education program should consider doing more of this groundwork in advance of implementation. In addition to achieving initial approval of the program by the faculty (Schrand, 2016), orienting all faculty members to the structure and rationale of the program, developing shared expectations through common assignments and rubrics, and fully developing and field-testing the ePortfolio application are all steps that could be built into the pre-implementation timeline to encourage student buy-in and confidence in the curriculum and the ePortfolio process.

References

- Buyarski, C. A., Aaron, R. W., Hansen, M. J., Hollingsworth, C. D., Johnson, C. A., Kahn, . . . Powell, A. A. (2015). Purpose and pedagogy: A conceptual model for an ePortfolio. *Theory Into Practice*, 54(4), 283-291. doi:10.1080/00405841.2015.1076691
- Khattab, M., Darwaza, S., Ingrasci, Z., Temple, C. (Producers), Temple, C., & Ingrasci, Z. (Directors). (2016). *Salam neighbor* [Motion picture]. US and Jordan: 1001 MEDIA and Living on One.
- Kinzie, J. (2013). Taking stock of capstones and integrative learning. *Peer Review*, 15(4), 27-30. Retrieved from <https://www.aacu.org/publications-research/periodicals/taking-stock-capstones-and-integrative-learning>
- Landis, C., Scott, S., & Kahn, S. (2015). Examining the role of reflection in ePortfolios: A case study. *International Journal of ePortfolio*, 5(2), 107-121. Retrieved from <http://www.theijep.com/pdf/IJEP168.pdf>
- Morreale, C., Van Zile-Tamsen, C., Emerson, C. A., & Herzog, M. (2017). Thinking skills by design: Using a capstone ePortfolio to promote reflection, critical thinking, and curriculum integration. *International Journal of ePortfolio*, 7(1), 13-28. Retrieved from <http://www.theijep.com/pdf/IJEP245.pdf>

- National Council for the Social Sciences. (n.d.). *Creating effective citizens: A position statement of National Council for the Social Studies*. Retrieved from <http://www.socialstudies.org/sites/default/files/publications/se/6505/650511.html>
- Nguyen, C. F. (2013). The ePortfolio as a living portal: A medium for student learning, identity, and assessment. *International Journal of ePortfolio*, 3(2), 135-148. Retrieved from <http://www.theijep.com/pdf/IJEP116.pdf>
- Peet, M., Lonn, S., Gurin, P., Boyer, K. P., Matney, M., Marra, T., . . . Daley, A. (2011). Fostering integrative knowledge through ePortfolios. *International Journal of ePortfolio*, 1(1), 11-31. Retrieved from <http://www.theijep.com/pdf/ijep39.pdf>
- Reynolds, C., & Patton, J. (2014). *Leveraging the ePortfolio for integrative learning: A faculty guide to classroom practices for transforming student learning*. Sterling, VA: Stylus.
- Rodgers, C. (2002). Defining reflection: Another look at John Dewey and reflective thinking. *Teachers College Record*, 104(4), 842-866. doi:10.1111/1467-9620.00181
- Rowley, J., & Munday, J. (2014). A "sense of self" through reflective thinking in ePortfolios. *International Journal of Humanities Social Science and Education*, 1(7), 78-85. Retrieved from <https://www.arcjournals.org/pdfs/ijhsse/v1-i7/9.pdf>
- Schrand, T. (2016). Design thinking as a strategy for general education reform. *Peer Review*, 18(3), 17-20. Retrieved from <https://www.aacu.org/peerreview/2016/summer/Schrand>
- Thomson, J. (2016). Toxic residents: Health and citizenship at Love Canal. *Journal of Social History*, 50(1), 204-223. doi:10.1093/jsh/shv105
- Yancey, K. B. (2009). Reflection and electronic portfolios: Inventing the self and reinventing the university. In D. Cambridge, B. Cambridge, & K. Yancey (Eds.), *Electronic portfolios 2.0: Emergent research on implementation and impact* (pp. 5-16). Sterling, VA: Stylus.
- Yancey, K. B. (2015). The social life of reflection: Notes toward an ePortfolio-based model of reflection. In M. Ryan (Ed.), *Teaching reflective learning in higher education* (pp. 189-202). New York, NY: Springer
- TOM SCHRAND is the Associate Dean for General Education and Professor of History at Thomas Jefferson University. His administrative duties include managing the ePortfolio process for all undergraduate students, as well as managing and assessing the Hallmarks Program for General Education. His recent research has focused on innovative curriculum design and high-impact pedagogical practices.
- KATHARINE JONES is an Associate Professor of Sociology and Gender Studies at Thomas Jefferson University. She co-ordinates and teaches the capstone course described in this article. Her current research interests are the intersections of gender, race, class, and sexuality, as applied to English soccer fans; autoethnographies of the body, grief, and illness; and feminist methodologies.
- VALERIE HANSON is an Associate Professor of Writing and Rhetoric at Thomas Jefferson University and since 2014 has served as the Program Director of the Hallmarks Core Curriculum, the undergraduate general education curriculum. Her teaching and research interests include writing, rhetoric and composition, visual rhetoric, rhetoric of science and technology, pedagogy and general education. Her book, *Haptic Visions: Rhetorics of the Digital Image, Information, and Nanotechnology*, was published by Parlor Press in 2015.

Acknowledgements

The authors would like to thank their former colleagues Dr. Stacey Van Dahm and Dr. David Rogers for their contributions to the design of the capstone course and its key assignments. The contents of this article were featured at AAC&U's 9th Annual Forum on Digital Learning and ePortfolios on January 27, 2018 in Washington, DC.

Appendix A
Disciplinary Snapshot Assignment Instructions

Hallmarks Capstone 499, Fall 2017**Assignment 1: DISCIPLINARY SNAPSHOT****Worth 10% of final grade; 4-6 pages****DRAFT DUE: Tuesday 9/5 (bring computer to class, with draft)****FINAL DUE: Thursday 9/14****Bring a hard copy to class, and upload the final assignment to BB using the SafeAssign link (to check your paraphrasing).****Assignment Learning Outcomes**

- Organize and explain your artifacts to illustrate how you integrated skills and knowledge from multiple academic and professional disciplines to address real-world challenges during your university studies.
- Review and assess previous coursework and co-curricular activities and compile relevant artifacts and writing reflective essays to demonstrate your fulfillment of the Hallmarks learning goals.

Overview

In this assignment, I'd like you to reflect on your life as a thinker and learner. Throughout this semester I will be asking you to represent the viewpoints of your discipline and its relationship to citizenship. This essay is an opportunity for you to reflect on why you chose your major, talk about what you learned in college, help others understand why you find your discipline a compelling framework for understanding the world, and explore the degree to which your major/profession is congruent (or not) with the way you make sense of the world.

You must refer to one course reading AND 5 artifacts from your Folio (two from the Hallmarks core, two from your major, and one co-curricular). You cannot copy and paste reflections you wrote for the folio. Instead, you need to draw new connections among the five artifacts that support your snapshot. You should paraphrase the ideas from readings (and your artifacts and reflections), and cite according to MLA standards, as discussed in class. **No quoting, please!**

You cannot possibly write about everything you learned in college in 4-6 pages, so please stress the following:

- Why you chose your area(s) of study
- What is it exactly that interests you about your discipline (be sure to be as specific as possible and include specific concepts, topics, methods, or perspectives of interest)
- The five pivotal moments in college that have shaped you as a professional. Which Hallmarks courses are most important to you? How do the artifacts reflect your identity as a professional? What do you wish you had learned more about in college?
- Your values, skills, and strengths (and if relevant, weaknesses)
- How you plan to use your new disciplinary knowledge and skills in your future, especially in your future career plans or goals
- What real-world problems are you interested in solving? How will your major assist you?

You may find that you have difficulty selecting what to write. Some of you may not want to disclose certain things about your lives, while others may dwell on events or activities that may not necessarily be looked upon favorably by others. **Remember, this is not an exercise in confessional writing.** Your goal is to help **other people understand** what disciplinary perspectives guide the way you make sense of the world and how you came to adopt those perspectives.

Additional Guidelines

- Assume a general reader who does not know you personally
- This essay will be made public, so do not disclose anything illegal or anything of which you are ashamed

- Do not dwell on the negative. If you find yourself wanting to discuss some major negative event, such as an accident or illness, try to emphasize what you learned from the experience rather than the disappointments or shortcomings it may have caused
- See syllabus for formatting instructions! (Name on cover sheet only, MLA citation standards, 12-point font, etc.)

How you structure this disciplinary snapshot is up to you. There is no one right way to go about it. You might write it as a personal narrative. You might write it as a reflection on your goals in your profession or more broadly in your life. You might write in first person (so, you can use “I” in this paper!) You might write it in third person, as if you’re profiling someone else. The adventurous among you may find a way to make it work in second person. You may decide to write in one smooth linear narrative, in a chronological but fragmented style, or in a way that jumps around in time and space. It’s up to you. Have some fun with it!

Disciplinary Understanding (by Veronica Boix-Mansilla, SSRC, Harvard Interdisciplinary Studies Project in Liberal Education http://webshares.northseattle.edu/IS/readings/what_is_interdisciplinary_learn.htm)

“Individuals demonstrate disciplinary understanding when they can use knowledge and modes of thinking developed by expert communities (e.g., in history, biology, mathematics, visual arts) in order to create products, raise questions, solve problems, and offer explanations of the world around them in ways that echo expert practices in the domain. Four dimensions are embodied in disciplinary understanding:

Knowledge: Ability to use key elements, concepts, relationships, theories, and schools of thought in the discipline.

Methods: Ability to engage in modes of inquiry that characterize the discipline, research methods, evidence, creation.

Purpose: An understanding of the goals that drive disciplinary inquiry and the ways in which knowledge can be used.

Forms: Ability to use the languages and forms of communication typical of the discipline (essays, artworks, scientific reports)”

Appendix B
Curating Citizenship Assignment Instructions

Curating Citizenship, Hallmarks Capstone Folio 499**Fall 2017**

Due dates: 11/30: Powerpoint in class and via email
12/11: Paper due via SafeAssign and email by 12 noon.

Assignment Learning Outcomes

- Review and assess previous coursework and co-curricular activities and compile relevant artifacts and written reflective essays to demonstrate your fulfillment of the Hallmarks learning goals.
- Organize and explain your artifacts to illustrate how you integrated skills and knowledge from multiple academic and professional disciplines to address real-world challenges during your university studies.
- Define the rights and obligations of citizens in local, national, professional, and global communities.

Curating Your Folio

At museums, curators select which artworks to exhibit, and they decide how to juxtapose different images so that they flow. Curators also situate the images within an appropriate context, explain their import to viewers, and create thematic links that organize the art, but still provide fresh perspectives on it.

You are going to become curators of your e-portfolio for this assignment. You will *curate* your portfolio to highlight five artifacts that illustrate EITHER your development as a citizen OR your enhanced understanding of citizenship. You may choose to emphasize any or all of the following: your own local community-based citizenship; your professional citizenship; your university citizenship; your global citizenship.

Of the five artifacts you choose, at least one must be from your major and at least one artifact must be from the Hallmarks Core. Other than that, you may choose which artifacts are most relevant to you as you decide how to tell your story about your understanding of citizenship.

You should integrate at least three of our class readings on citizenship into your analysis, and also two additional external sources that add to your definition of citizenship. Pay attention to the description of curators' work above, as you decide how to use the artifacts from your folio to tell your story. Consider how your learning outcomes and your folios work together with the readings and each other to build an analysis of citizenship.

Some helpful hints:

- What are some aspects of active, engaged citizenship that have emerged during our readings and discussions?
- How do you see some of the learning outcomes in Hallmarks as related to aspects of citizenship? Look back at readings for help with this, and read the Hallmarks bullet points.
- Do you see any connections between different learning goals as you reflect on citizenship?
- As you review your assignments from high school or your first or second year of college, do you see a development over time in the ways that you understood various outcomes, and perhaps, therefore, various aspects of citizenship?
- Consider the obligations of citizenship, as well as the rights of citizenship.

Two items are due for this project:

1. In class on the assigned days, you will present no more than five PowerPoint slides (including your works cited) as your curated citizenship exhibit. You may use images from your e-portfolio, or you may choose new images that sum up your artifacts and their relationship to citizenship. Text on your slides should be minimal, but any text you provide should explain how the artifacts relate to the development of your citizenship or your enhanced understanding of citizenship. You may narrate the PowerPoint in person, but

you may also record a voice-over to ensure that you are succinct and intentional—and so that you can “capture” the presentation for future reference (or for your folios!)

During your presentation, students will write answers to questions about your presentation, so that you receive their feedback.

2. On 12/11 at 12 noon, a 2-3 page paper will be due that explains the choices you made in your presentation to explain your citizenship journey or your enhanced understanding of citizenship. You can draw on your curation of the artifacts, reflections, and readings you used for your presentation. You can also use the feedback you received and the time between the two due dates to refine your ideas. (See final page for more details.)

Grading Criteria for PowerPoint Presentation and Script:

- Are the slides legible and designed for the audience to grasp the main point quickly and easily?
- Do you avoid “reading off” the slides in your presentation?
- Do you use ideas from three class readings and two external readings thoughtfully and carefully to develop an understanding of citizenship?
- Do you clearly use the idea of citizenship as the theme to curate the artifacts?
- Is your analysis of the meaning of citizenship thorough and clear on the slides and in your script?
- Do you cite sources (including all images) appropriately, using MLA citation style?

Curating Citizenship, Hallmarks Capstone Folio 499

Paper Instructions

12/11: Paper due via SafeAssign and email by 12 noon.

This part of the final assignment is a 2-3 page paper that explains the choices you made in your presentation to explain your citizenship journey or your enhanced understanding of citizenship. You should use the feedback you received in class and the time between the two due dates to refine your ideas for the paper.

You can draw on your curation of the artifacts, reflections, and readings you used for your presentation. However, be careful not to repeat the script of your presentation. I have a good memory and take good notes, and so I will recognize your presentation! Also, don’t use your reflections from your artifacts verbatim, since they won’t make much sense out of context—and I will also recognize those (as will SafeAssign)!

There are five required parts to this paper (not necessarily in this order):

1. An explanation of how the presentation came together as you began to think about citizenship in relation to your folio.
2. Your sense of what worked, and what did not work in your presentation. What would you do differently if you had to do it again?
3. Reflection on your script and your citizenship journey, including general reflections on what it means to develop an understanding of citizenship.
4. Responses to the questions, comments and feedback in class from your peers and your professor.
5. MLA works cited page (and in-text citations).

Grading Criteria for the Paper:

- Student’s ability to move beyond the presentation script and the reflections and descriptions of artifacts in the folio to reflect on the presentation as a whole.
- Student’s ability to analyze what worked and what did not work, and what he/she would do differently if asked to do it again.
- Student’s reflections on the script and the citizenship journey, including general reflections on what it means to develop an understanding of citizenship.
- Student’s responses to questions, comments, and feedback in class.
- Quality of works cited page, in-text citations, and grammar.

Appendix C Hallmarks Reflections

Hallmarks Folio reflections are 250-300 word mini-essays that help readers—professors, Philadelphia University community members, your future self—understand the context and value of your artifact in terms of your achievement of the learning goals associated with the outcome. Tell your story of your learning experience—what you did, what and how you learned, and how this was valuable to you in terms of progressing towards the learning outcome and towards your professional and personal goals.

Reflection Essay Requirements

Your essay should cover the following points: the questions below are meant to help you consider what to include:

- **Identify your artifact:** What type of artifact is this: what course is it from, and what is the Hallmarks learning goal to which it connects? Who was the audience, and what was the instructor's purpose in assigning the artifact?
- **Assess your learning and progress:** In what ways did the experience of producing your artifact help you achieve the Hallmarks goal? What were the challenges you found in addressing this goal?
- **Reevaluate the learning goal:** How did the experience of producing the artifact challenge or support your understanding of the Hallmarks goal?
- **Connect your new learning:** How might this artifact (and the learning experience associated with it) connect to your prior learning (in other classes or assignments, professional experiences, other Hallmarks goals) and/or to your future personal or professional goals?
- **Communicate clearly:** Does your essay communicate its points clearly, concisely, and correctly?

Task

To complete your reflections well, you should:

- Consult the Hallmarks website (<http://www.philau.edu/hallmarks>) for a detailed description of the goal.
- Think about the project by reviewing the assignment (if possible) and your own work.
- Brainstorm or freewrite about the instructor's purpose for the assignment that produced the artifact and what you learned.
- Draft and revise to complete your task in about 300 words.

Reflecting on Reflecting: Summer Undergraduate Research Students' Experiences in Developing Electronic Portfolios, a Meta-High Impact Practice

Karen Weber and Keri Myrick
University of Houston

This pilot study assessed how using electronic portfolios (ePortfolios) as a meta-high impact practice (meta-HIP) might influence student learning through reflective practice. Eleven undergraduates participating in a summer research program reflected weekly on their research experiences through building and using ePortfolios, and attended three focus groups. The researchers assessed the students' level of engagement as a result of their weekly posts and studied how they used ePortfolios to enhance their learning. Results suggest that the students utilized their ePortfolios to communicate their enjoyment for their research projects as well as their increased knowledge and skills; make their learning more visible; track their achievements, which resulted in enhanced motivation; and demonstrate their pride in intellectual and personal growth. The students also appreciated the feedback they received on their reflections. As drawbacks, the participants believed that building an ePortfolio could be challenging in regards to designing the aesthetics, developing the appropriate content, securing the time for development, and using the website for the long-term. Consequently, the researchers found that a student learning community formed as a result of using ePortfolios as a meta-HIP. Nevertheless, for ePortfolio implementation to be successful, challenges pertaining to faculty adoption, resources, training, and scaling need to be addressed.

Through self-examination, students can find meaning in their educational experiences. Their learning process becomes knowable through reflective practice, leading to heightened confidence in their progress and abilities. For instance, students can differentiate between intended and actual educational outcomes and identify their individual learning strengths and preferences. As a result, reflective practice may increase and improve student engagement and performance.

Self-evaluation is a common way to assess HIPs, and institutions are increasingly turning to electronic portfolios (ePortfolios) to provide this type of assessment (Bryant & Chittum, 2013; Eynon, Gambino, & Török, 2014; Kahn, 2014). ePortfolios provide students with a tool to gauge their growth while participating in additional HIPs, such as community- and service-learning, and study abroad (Hubert, Pickavance, & Hyberger, 2015). Because of their well-documented "longitudinal capacity" (Eynon & Gambino, 2017, p. 205), as well as their portability and—with proper training—relative ease of use, ePortfolios demonstrate a holistic approach for showcasing students' personal and professional achievements in a wide range of media (Bowman, Lowe, Sabourin, & Sweet, 2016). Furthermore, using ePortfolios effectively can promote intellectual and personal growth by fostering reflection (Buyarski, 2014).

In addition to ePortfolios, faculty-mentored undergraduate research is also considered a high-impact practice (Kuh, 2008). Penny Light, Chen, and Ittelson (2012) identified HIPs as the most meaningful tools for gauging learning and suggest that ePortfolios pair widely with these types of activities. The researchers for the present study—administrators of co-curricular, high-impact programs at a large, top-tier research university in a diverse, urban setting—had quantitative data to show evidence of their undergraduate research students' gains

in retention. However, they had never qualitatively measured their students' level of engagement while participating in undergraduate research.

For this reason, the researchers created a pilot study in which undergraduates developed ePortfolios while conducting their summer research projects. The researchers explored whether using an ePortfolio as a means for students to reflect on their research experiences, employing *folio thinking*, might enhance student learning (Penny Light et al., 2012). Although ample studies examine the effectiveness of HIPs within higher education (i.e., Bonet & Walters, 2016; Jarmon, Traphagan, Mayrath, & Trivedi, 2009; Sweat, Jones, Han, & Wolfgram, 2013), we were more interested in the value of using ePortfolios to assess another high-impact practice: how might implementing ePortfolios as a meta high-impact practice (meta-HIP) aid students in reflection, and what might this type of reflection mean for their learning experience?

The cumulative and compensatory effects of ePortfolios (Watson, Kuh, Rhodes, Penny Light, & Chen, 2016) make them an obvious vehicle for tracking and assessing the impact of HIPs. Recognizing the potential benefit of employing ePortfolios as a meta-HIP—or using *folio thinking* to reflect on high-impact experiences—the researchers sought to measure the effect of student engagement for this particular cohort of undergraduate researchers (Watson et al., 2016). They also wanted to discern how emerging themes from the students' reflections related to this method of ePortfolio use (i.e., would these themes translate into achieving goals, identifying patterns in how they learned, and altering studying behaviors on shorter-term HIPs such as summer undergraduate research programs?). This

study answers the call for more empirical research on ePortfolios as a meta-HIP (Kahn, 2014; Kuh, 2017) and aims to further examine the ways in which ePortfolios enhance HIPs and inform pedagogy.

Literature Review

Using ePortfolios to evaluate applied and collaborative learning is an effective practice (Kahn & Scott, 2013; Singer-Freeman, Bastone, & Skrivaneck, 2016). The present study sought to understand better the ways in which students can reflect effectively and find meaning while conducting undergraduate research. This literature review begins by defining reflection and describing the educational outcomes associated with engaging in reflective practice. Next, HIPs are defined and explained, followed by a discussion on tracking reflection through the use of ePortfolios. Finally, an explanation of the rationale for the study is presented.

Benefits of Reflection

John Dewey's seminal work, *Experience and Education* (1938), firmly established the connection between reflection and education. Reflection can generally be thought of as "a process of turning experience into learning" (Boud, 2001, p. 10). For students of all ages and disciplines, engaging in the reflective process can translate into a wide array of educational outcomes. These outcomes include, among other things, increased self-awareness, clarity in communication, and valuable interpersonal skills (Copeland, Birmingham, de la Cruz, & Lewin, 1993; Eynon & Gambino, 2017; Penny Light et al., 2012; Reynolds & Patton, 2014; Rogers, 2001).

Engaging in reflection can also build students' confidence and ground deep learning in personal experience (Dewey, 1938; Kolb & Kolb, 2005; Penny Light et al., 2012; Reynolds & Patton, 2014). Concurrently, reflection assists students with setting and assessing learning goals and promotes problem solving, innovation, and critical thinking (Landis, Scott, & Kahn, 2015; Penny Light et al., 2012; Reynolds & Patton, 2014). Overall, reflection aids students in making connections between coursework and personal experience or across disciplines, courses, and programs (Peet et al., 2011; Reynolds & Patton, 2014).

To be effective, reflective practice requires scaffolding to support student engagement (Hatton & Smith, 1995; O'Keeffe & Donnelly, 2013; Reynolds & Patton, 2014; Ryan, 2013). Perhaps the most highly regarded reflective-practice model for HIPs is Kolb's (1984) Experiential Learning Theory. Kolb (1984) stated that students learn best by cycling through four stages: concrete experience, reflective observation, abstract conceptualization, and active experimentation

(Eynon & Gambino, 2017; Jarmon et al., 2009; Kolb & Kolb, 2005; Miettinen, 2000). As it supports student-engagement and a sound structure for learning and programming, Kolb's theory has been associated with student success and higher graduation and placement rates (Eynon & Gambino, 2017; Eyler, 2009). Finally, Kolb's theory provides a holistic view grounded in constructivism from which to evaluate knowledge (Peet et al., 2011).

ePortfolios for Reflection

In order to discern how the students' reflections impacted their undergraduate research experience, the researchers were interested in observing the phenomenon of how students use ePortfolios as a tool for learning, goal setting, and recognizing educational patterns (Johnsen, 2012; Zubizarreta, 2009). For instance, would their learning from their summer research experiences extend into other areas of their education (Buyarski et al., 2015)? With guidance, could they make connections from one educational experience to another, hence employing integrated learning (Hubert, Pickavance, & Hyberger, 2015; Peet et al., 2011; Yancey, 2009)?

High-Impact Practices

Study participants engaged in a full-time summer research experience, one of 11 high-impact practices. In 2008, George Kuh, along with researchers from the Association of American Colleges and Universities (AAC&U), identified 10 high-impact practices that promote deep learning and student success. These HIPs typically incorporate active learning, result in a heightened student commitment and increased collegiate retention and graduation rates, and often include a reflective component in implementation (AAC&U, 2013).

Subsequently, while developing Indiana University – Purdue University Indianapolis' scaling up efforts as part of the Connect to Learning project, Kahn and Scott (2013) recognized the potential of ePortfolios as a "meta'-high impact practice" (para. 30). ePortfolios, they argued, pair naturally with HIPs due to their capacity for improving the effectiveness of other practices, such as "first-year seminars, capstones, service learning, study abroad, and internships" (Kahn & Scott, 2013, para. 31). Eynon and Gambino (2017) built upon this notion, ultimately providing sufficient empirical evidence to persuade the AAC&U to recognize ePortfolios as the 11th official HIP (Kuh, 2017; Watson et al., 2016). Importantly, this inclusion marked the only addition to the HIP catalog in nearly 10 years (Kuh, 2017).

Tracking Reflection

Frequently, methods of assessment for HIPs depend on self-evaluation and reflection. Effective

reflective practice requires student engagement, structure, and assessment. ePortfolios are a useful, broad-ranging tool for scaffolding reflection (Barrett, 2007; Eynon et al., 2014; Landis et al., 2015; Reynolds & Patton, 2014; Yancey, 2009); learning ePortfolios, specifically, have proven vital to measuring student engagement and observing the educational process (Barrett, 2007). Using learning ePortfolios can also bolster metacognition (Bokser et al., 2016).

Consequently, ePortfolios have become an increasingly popular tool for tracking and reflecting upon participation in other HIPs (Kuh, 2017). Specifically, ePortfolios provide students with a long-term, collaborative repository of HIP participation and analysis (Eynon & Gambino, 2017; Kahn, 2014; Penny Light et al., 2012). Recent research suggests that, when done well, ePortfolios' "accentuating effects" (Watson et al., 2016, p. 66) allow students to highlight specific instances of deep learning in a way that cannot be realized through transcripts, resumes, or even paper portfolios (Bowman et al., 2016; Kahn, 2014). For this reason, ePortfolios also illustrate to educational institutions and employers a collection of skills gained through curricular and co-curricular activities.

In addition, ePortfolios provide students with a platform for recognizing and articulating moments of discovery (Morreale, Van Zile-Tamsen, Emerson, & Herzog, 2017; Peet et al., 2011). The importance of the "aha" moment students encounter when they realize that "learning how [they] learn *is* [sic] important" (Cambridge, 2007, p. 1) is crucial to their advancement through the learning and reflective processes. Through ePortfolio usage, students become more aware of their skills and abilities (Bowman et al., 2016). As a result, learning becomes more visible to students as they transition toward a more critical and intentional reflective practice (Eynon et al., 2014; Penny Light et al., 2012).

Undeniably, students benefit most when they can personalize learning (Penny Light et al., 2012). As students develop an aptitude for *folio thinking*, they begin to view their experiences and what they learned through the occurrences more consistently, thus gaining an appreciation for reflective practice and lifelong learning (Penny Light et al., 2012). Through mentored reflection, students gain valuable feedback, which is essential to student learning (Bowman et al., 2016; Eynon et al., 2014; Pearson & Heywood, 2004; Yancey, 2009). Through peer-to-peer feedback in forums, students build communities, providing a safe space in which to glean useful insight and new perspectives (Bowman et al., 2016; Hadley, 2007; Johnsen, 2012).

Furthermore, acknowledgment of accomplishments as well as constructive criticisms, when needed, helps students build confidence and take chances in unfamiliar areas of learning (O'Keeffe & Donnelly, 2013). Regularly scheduled reflection activities—

including timely feedback—have a significant impact on student development of self-regulatory habits (Cheng & Chau, 2013; Johnsen, 2012). Likewise, they garner richer, more thoughtful reflections over time, as students can make modifications throughout the learning activity rather than awaiting a final assessment (Penny Light et al., 2012), when the opportunity for honing reflection skills might be lost (Bowman et al., 2016). For this reason, the researchers provided consistent feedback to the participants to ensure that they received the structure and support needed to make the most of their reflective practice.

Another benefit of using ePortfolios is that they enable students to "demonstrate their learning from the varied sites in which such learning occurs" (Watson et al., 2016, pp. 66-67). This makes ePortfolios an ideal tool for measuring knowledge and growth for undergraduate researchers, since their learning takes place in a wide range of locations and settings. This study assesses whether students make connections through reflection among their educational experiences, thus encouraging self-discovery, promoting metacognition, and heightening overall engagement (Bass, 2014; Drury, 2006).

Rationale for Study

Kuh (2008) emphasizes the importance of students participating in more than one high-impact practice during their academic career, and empirical evidence suggests this is effective for student success (Brownell & Swaner, 2009; Morreale et al., 2017). Notably, the Connect to Learning project provides a comprehensive look at the benefits of conducting HIPs simultaneously (Eynon & Gambino, 2017; Watson et al., 2016), and this method of packaging HIPs has been found to have positive links to student engagement and retention (Morreale et al., 2017). For instance, in a longitudinal study conducted by Indiana University–Purdue University Indianapolis, Hansen, Graunke, and Thorington Springer (2016) found that students who participate in a thematic learning community while conducting service-learning have higher grade point averages and retention rates. However, few studies examine the impact ePortfolio implementation has on undergraduate research. The majority of the literature is assessment-driven (Bowman et al., 2016). In contrast, this pilot study investigates how employing meta-HIPs might increase engagement and impact students' articulation of achieving goals, identifying patterns in how they learned and altering studying behaviors.

Method

This was a qualitative, phenomenological study (Patton, 2015). The investigation included reviewing

Table 1
Participant Chart Including Academic Major, Classification, and Gender

Participant	Academic major	Classification	Gender
1	Biomedical engineering	Senior	Female
2	Biomedical sciences	Sophomore	Male
3	Geophysics	Senior	Male
4	Economics	Senior	Male
5	Electrical engineering	Senior	Female
6	Economics	Junior	Male
7	Architecture	Sophomore	Male
8	Biomedical sciences	Sophomore	Male
9	Psychology	Junior	Male
10	Marketing	Junior	Female
11	Computer science	Senior	Female

11 students' weekly reflections on their research experiences and collecting and analyzing their responses during three focus groups. The research team included two full-time staff members who were involved in collecting and coding qualitative data; a third staff member served as an observer to ensure the integrity of the research setting. One of the researchers transcribed the first of the three focus groups; an outside service transcribed the remaining two sessions. The software program Dedoose was used to store, code, analyze, and present the data. This active investigation raised questions about the data, which then was used to create categories and concepts (Corbin & Strauss, 2015; Strauss & Corbin, 1990).

Location for Study

Staff associated with an undergraduate research office (the Office) housed within an honors college at a top-tier research university in Southeast Texas conducted this study. For over 13 years, the Office has served all undergraduate students at the institution and grown in size and scope each year to meet the needs of an ever-changing university population. Notably, the Office coordinates a wide range of programming to students from all majors. These programs include an early research experience for rising sophomores and juniors, a part-time semester research experience for juniors and seniors, a full-time summer research program for all continuing undergraduates, and a capstone thesis program for seniors.

Participant Recruitment

The subjects for this study were recruited through their participation in the Office's full-time summer research program. This faculty-mentored summer research experience is a 10-week intensive program for approximately 80 rising sophomores, juniors, and seniors from all majors. Students receive a scholarship for

conducting research through the summer program. Participants were recruited for the study in-person during the program's late spring orientation, and again via email. They were made aware that their participation was entirely voluntary; their decision whether or not to participate would in no way affect their standing in the summer research program, and they could leave the study at any time. Initially, approximately 15 students volunteered to participate; ultimately, several declined to join the study before it began because of scheduling and timing constraints. One student, for similar reasons, dropped out of the study during week three.

Participants

A total of 11 students participated in the entire study and represented a diverse range of ethnicities and majors—biomedical engineering, electrical engineering, biomedical sciences, computer science, geophysics, economics, architecture, psychology, and marketing. Table 1 describes the students by academic major, classification, and gender. Only one of the 11 participants had previous experience building a website of any kind; none of the students had ever developed an ePortfolio.

Focus Groups

The 11 ePortfolio students met with the researchers a total of three times during the study to participate in focus group interviews. The researchers asked open-ended interview questions, and as a result, garnered rich, descriptive responses from the participants (see Appendix). This enabled the researchers to gain a deeper understanding of the students' experiences using ePortfolios (Patton, 2015). The first of three focus groups was audio recorded, and observational notes were taken by two individuals during the interviews: one researcher and an additional observer approved by

the University's Institutional Review Board. Focus groups two and three included the second researcher.

The meetings aligned with the timeline for the 10-week summer research program. The ePortfolio participants met once during Week 2, once during Week 6, and once during Week 10. A workshop on how to develop an ePortfolio comprised much of the first meeting. One of the researchers presented a website built in Wix as an example of an ePortfolio, and she showcased other students' Wix websites as exemplars. While the majority of the participants built their websites in Wix—the digital platform utilized in the university's ePortfolio class—the architecture student opted to work in WordPress because this was a platform he had used before and it offered optimal customization.

This study did not require students to use a specific template, as the purpose of the study was focused on the value of the process, not the final product. In addition to learning how to use the technology, students also addressed the purpose, audience, and goals for their ePortfolios by completing a goal chart. The students' responses to open-ended interview questions allowed the researchers to gauge several items: the participants' expectations of building an ePortfolio, level of interest in developing the website, concerns regarding potential challenges within the process, and students' plans for how they would use their websites.

During the final two sessions, questions pertaining to students' progress in developing their websites and how they were using them informed the discussion. Specifically, the researchers asked students about any challenges in developing their sites, what they learned from using their ePortfolios, and their level of interest in building their websites. These group interviews also provided an opportunity for students to share their websites with one another and engage in valuable peer feedback on each other's ePortfolios. The third focus group asked students to assess their overall experience using an ePortfolio throughout the summer, and solicited responses on the advantages and disadvantages of developing a website while conducting a full-time summer research project. At the end of the program, students who chose to publish their sites had the opportunity to share their finished products with the other participants, which was outside the study's parameters.

Prompts for Participants

In addition to attending three group interviews, the participants were asked to reflect and write each week, using prompts, about their research experiences. If their ePortfolios were not developed, students submitted links to or screenshots of their ePortfolios or text documents. The reflective prompts included the following:

- What was the most interesting task you completed this week?
- What was the most challenging issue you encountered this week?
- How might these experiences positively or negatively impact your summer research project?
- Has your perspective on your research project changed? If so, how?

Data Analysis

For the present study, it was essential that the data analysis parallel the inherent dynamic nature of ePortfolio creation. The researchers used Heinrich and Rivera's (2017) model for high-impact and experiential learning assessment (HELA) as a method for analyzing the students' weekly reflections. Heinrich and Riviera developed HELA with the notion that student reflections should be assessed through embedded outcomes or through an inductive process. Therefore, the assessment of the data employed inductive open coding rather than using a deductive approach in analyzing the findings. The AAC&U Creative Thinking VALUE rubric (AAC&U, 2009) supported the identification and description of the codes developed by the researchers.

The process of analyzing the transcripts from the three focus groups included identifying common themes and insights derived from the interviewees' responses to questions pertaining to ePortfolios. The research questions were answered through in-depth group interviews, as well as through observational notes. These responses were then compared with the students' weekly ePortfolio reflections using triangulation. Intercoder reliability was employed when coding the weekly reflections submitted by the students and when analyzing the results of the study. Through this process, subthemes and then dominant themes were identified.

Results

Before the study began, the majority of the participants expressed a strong desire to have a platform to organize their curricular and co-curricular experiences and artifacts. Most considered simply learning how to create a website a desirable skillset to hone. Participants expressed at the start of the study a deep interest in using the ePortfolio both as a tool for learning—collecting, organizing, and reflecting on their summer research experience—and as a medium for marketing and promoting their achievements to potential employers, faculty mentors, and graduate and professional school admissions committees.

Whereas some students built fully developed websites early on in the process, the majority of the students solely used their ePortfolios for posting on their

summer research experiences. Nevertheless, most of the students communicated their intent to ultimately use the tool to showcase additional involvements, such as academics, hobbies, and leadership and organizational activities. By the conclusion of the study, about one third of the students did “go live” with their ePortfolios and included content presenting their academic and professional highlights. Several participants discussed their plans to parlay their current work into longer-term ePortfolio use through adding tabs on the navigational bar and other integrative processes and to go live with their sites before they graduated.

While study participants saw value in creating ePortfolios and their potential for future use, some reported putting reflections and website creation second to their commitment to their research. Others, imposing on themselves accountability for the weekly reflections, became less concerned with aesthetics and focused primarily on that component of ePortfolio use. This poses a concern with regard to long-term implementation and should be addressed for future programs to be effective.

Dominant Themes

The most dominant themes that emerged when analyzing the students’ weekly reflections and the feedback received from the interviews included: communicating enjoyment of project and increased knowledge and skill sets, making learning more visible, tracking achievements resulting in enhanced motivation, demonstrating pride in intellectual and personal growth, and sharing appreciation for feedback received on their weekly reflections. Challenges communicated by the participants included: developing a website that was aesthetically pleasing, the time involved in creating a website, the appropriateness of ePortfolios for all students, and the viability of long-term use of the website.

Communicated enjoyment of project and increased knowledge and skill sets. Students commonly used their ePortfolios to express optimism or excitement about their research projects. They used the online platform to discuss how they were acquiring new skills, using innovative equipment or software, and addressing learning curves within their projects. Many perceived their websites as a demonstration of self, and as an outlet for creativity and communicating more effectively about their research experiences. For instance, students wrote the following comments: (a) “This is just the start of the data analysis I have to do; however, it is fun, exciting, and full of new surprises” (Student #6, Reflection 2); (b) “There were several delays this week but in the end, we were able to create a process that will make data processing go easier for both us and for future teammates” (Student #5,

Reflection 2); and (c) “It has helped me rekindle my creative touch that I had when I was younger, but lost when I went to college” (Student #10, Focus Group 2).

Made learning visible. The students used the tool to make their learning more visible. At the beginning of the study, the students relied heavily on the prompts, but as the weeks progressed, their responses evolved into sharing their own experiences outside the prompt. They began making connections within their learning. They used the online platform as a means to think deeply about their projects and consider the broader picture of their research. The students also took time to reflect on how this summer experience might have a greater impact in the years to come. They consistently recognized the opportunities for increased understanding that arose through conducting research, and grew to value their projects. The students did not shy away from acknowledging the problems and challenges encountered along the way, but more often than not, they would suggest a potential solution in an effort to keep the project moving forward. Students noted the following: (a) “I can look back to [the reflection essays] and say, ‘Oh, wow. It was hard back then. But now I mean I got to the end result pretty easily’” (Student #3, Focus Group 2); (b) “It helps me see what I’ve done and then look ahead to what I want to do” (Student #5, Focus Group 2); and (c) “I can see what I did wrong, or I can see that the steps kind of followed before to try to approach problems, and so that’s what I’m kind of using as a journal” (Student #2, Focus Group 2).

Tracked achievements resulting in enhanced motivation. In addition to using the ePortfolio as a tool for reflection, students appreciated the ability to continually record their accomplishments. This tracking also bolstered time efficiency, acting as an online to-do list, and allowed the ePortfolio to serve as a repository for academic and professional achievements. Over time, the students also became more cognizant of performing activities they could ultimately include within their ePortfolios. Thus, their ePortfolios resultantly served as a tool that heightened their motivation. Indeed, the students’ responses highlight the multifaceted purpose of ePortfolios as a means for self-assessing progress, storing work, and sharing accomplishments with an external audience. One student explained, “I would say it kind of motivates me because if there’s nothing that I can write about, then I feel it means I didn’t do much this week” (Student #11, Focus Group 2). Another student said,

So what this site has kind of allowed me to do is in the beginning . . . you have a list of what you’ve done. So before I go and speak about anything that requires me to speak about what I’ve done, I’m able to look at that, and it gives you a refresher. (Student #6, Focus Group 2)

A third student noted,

It's made me think more about how I'm using my time because now I'm always thinking OK, if I do this I'll be able to put it on my website, but if I you know watch Netflix, I'm not going to be able to put that on my website. So it's made me think more about how can I use my time wisely developing new skills and learning new things. (Student #8, Focus Group 2)

Demonstrated pride in intellectual and personal growth. As a result, the process of developing ePortfolios boosted students' confidence. The students' reflections often shared their satisfaction in what they produced or achieved, expressing their excitement and optimism regarding their projects, as well as their increasing abilities as researchers. They were able to review their progression over the course of 10 weeks and thus take pride in their intellectual growth. They demonstrated recognition of their enhanced personal responsibility, independence, and ability to see a task to fruition as a result of their research projects. Through this experience, some participants grew to appreciate the practice of reflection. For instance, students wrote: (a) "I am so happy this week!! I believe that I have achieved a breakthrough in my research that finally I am seeing the patterns in the data sets" (Student #11, Reflection 6); (b) "This is also a great learning experience as a young researcher because it teaches me that I am responsible for the data I produce" (Student #11, Reflection 3); and (c) "I've learned more of the importance of reflection as a whole" (Student #3, Focus Group 3).

Shared appreciation for feedback. The participants enthusiastically expressed their appreciation for the feedback they received each week. They were pleased to have the opportunity to share consistent updates on their research with someone outside their field. They also knew they were not posting updates in a vacuum—someone was on the receiving end, reading and replying to their responses. All participants were supportive of future undergraduate researchers reflecting on their research and developing an ePortfolio (provided someone would respond to their reflections). They were all also amenable to sharing their reflections and websites with their faculty research mentors. For example, one student explained, "I think the more eyes you can get on [your reflections], whatever you're trying to say, is always beneficial" (Student #7, Focus Group 3).

Expressed challenges. The most commonly expressed challenges included the difficulty of building an aesthetically pleasing website and the amount of time required to develop the ePortfolio. Finding the appropriate balance between sharing professional and personal information also was a noted barrier. The ability

or need to be creative when developing the websites was perceived by some students as a positive and by others as a pitfall. It was easier for the students to post and reflect on their research experiences because they were fully immersed in their projects, as compared to sharing information on their other activities outside the summer research program. There was also some concern about how they would use the ePortfolio after their summer experience. All of the participants found reflecting on their research experiences or developing an ePortfolio to be useful, but recognized that not all students may embrace this tool for reflection. For instance,

I don't think something like this is useful for everyone . . . I think we are a specific group of people that wanted to do this and committed to putting in the time and effort to work on it and make it good. But I don't think that this would be something everybody would want to put their time and efforts towards . . . But for us, it is productive. (Student #10, Focus Group 2)

Therefore, it is clear that the students took full advantage of using their ePortfolios to post the highlights of their research projects. They used the medium as a means of acknowledging setbacks and then outlining ways to progress forward, hence supporting Kolb's (1984) theory and the AAC&U Creative Thinking VALUE rubric (AAC&U, 2009). By making these connections with their educational experiences, they are actively engaging with their experiences through reflection, fostering lifelong learning, and promoting a growth mindset.

Implications of Study

These findings have several interesting implications within the field of collegiate high-impact practices and ePortfolios. To begin with, the students bonded while participating in the study. As the students began to discuss their experiences with building out their websites, they realized they shared the same highs and lows. Although they were working on independent research projects from disparate fields of study, they formed a community through sharing experiences of building their websites. They discussed their discoveries and frustrations with using the technology, hence benefiting from each other during the focus groups. The participants were also amused that they were not alone in using the ePortfolio as a motivational tool to ensure that they would have content to include in their website each week. Student researchers can feel isolated when conducting their projects; they often work independently and can struggle with staying focused and on task. Creating learning networks or communities can address this prevalent issue.

Next, the participants greatly appreciated the responses they received from one of the researchers each week on their reflective posts. This consistent feedback regarding their research experiences addressed some concerns commonly associated with undergraduate programs of this type. For example, the Office frequently receives complaints from undergraduates that they can feel inexperienced and overwhelmed when conducting research. Yet being able to convey their feelings through responses to prompts, and to receive comments from the administrator, likely improved their ability to work through issues encountered in the research setting. Despite setbacks, they recognized their increasing abilities as researchers, as well as their enhanced capacity to effectively communicate about their projects to others.

Ramifications of Implications

Successful ePortfolio implementation requires ample time and support (Johnsen, 2012). Undoubtedly, large-scale implementation by a single instructor would be an unrealistic expectation. Effectively supporting larger groups of students requires an organized, scaled effort. For departmental or institutional ePortfolio adoption, faculty buy-in, training, and resources are critical (McWhorter, Delello, Roberts, Raisor, & Fowler, 2013). For instance, the process of reviewing and responding to students' posts is extremely time consuming. To address this, ePortfolio facilitators could ask students to reflect and post regularly while participating in their high-impact practices, but might be selective in how many times they reply to students' posts. Peer-to-peer feedback might also shift the onus from the instructor and provide more meaningful, robust commentary on which aesthetic- or content-focused responses could be shared. Consequently, during the final focus group, the participants expressed an interest in sharing their postings and working with each other, so this may be a viable option. One student said, "From the very beginning, it would have been helpful . . . maybe even just make a Dropbox account with everybody's links to their websites just so we can kind of bounce ideas off each other" (Student #7, Focus Group 3).

The participants were also grateful for the instruction they received on how to build an ePortfolio, particularly before they embarked on the development process. Students need theoretical and technological guidance when developing their websites (Johnsen, 2012; Watson et al., 2016). If the instructor or program coordinators do not possess this skillset, someone who is knowledgeable about ePortfolio theory and practice should be consulted. This individual should be available to provide support to students throughout the ePortfolio process. For instance, one participant mentioned the challenge associated with defining the particular

audience for his ePortfolio, a theoretical issue that is crucial to students' success in their ePortfolio development. The students need assistance on what they should include in their websites, why they should include this content, and finally how actually to build ePortfolios (Johnsen, 2012).

For large-scale adoption, incentives are also essential for success. This can be accomplished through institutional rewards for the use of high-impact practices through academic promotion and tenure. In addition, asking faculty to develop ePortfolios when uploading their CVs and other materials for promotion may invoke increased adoption for the tool. Faculty who have personal experience with ePortfolios may be more inclined to include them in their curriculum and pedagogy within the classroom (Bowman et al., 2016). The researchers feel it is worthwhile for institutions to work through these issues, as it is critical that our 21st-century learners have "more opportunities to reflect on, synthesize, and demonstrate the knowledge and skills they are gaining both within and outside of the classroom" (Peet et al., 2011, p. 21).

Limitations of Study

Limitations pertaining to this pilot study arose. To begin with, the pool for participant recruitment comprised motivated students who received scholarships to conduct research. The students who developed ePortfolios self-selected from this pool to serve as participants. Thus, it could be argued that by volunteering for the study, these students were already more likely to be engaged. While this may be true, it does not change the fact that the students did use their ePortfolios as a tool for making connections with their learning. Nevertheless, testing this model on two sample populations would be prudent. A future study might explore two cohorts—one group who receives scholarships for creating ePortfolios and a second group who does not receive compensation.

Furthermore, this pilot study only included 11 students, which was approximately 13% of the program's entire summer research student population. Subsequently, these findings are not indicative of the program's total cohort of summer researchers. Participation in the pilot study was optional, as there were over 80 students in the entire summer research program; the researchers opted for working with a smaller sample size to allow for deeper analysis and more detailed feedback to the participants. In addition, although the participants' majors, classifications, and genders varied, there were no obvious differences noted in the content and caliber of their reflections. Perhaps if the sample size were larger, distinctions pertaining to field and whether the student was a sophomore or senior would become more obvious (see the Potential

Future Studies section). Broader analyses should include a larger sample population.

Also, since one of the researchers was the coordinator of the summer program, there could have been a desire by the students to please the researcher. As a means of addressing this concern, the students were told and reminded that their participation was voluntary and would have no bearing on their status in the summer program. The participants were also encouraged to be authentic within their reflective submissions. Finally, to prevent bias on the part of the researchers, inter-coder reliability, as well as Heinrich and Rivera's (2017) HELA model, and the AAC&U Creative Thinking VALUE rubric were used (AAC&U, 2009).

Potential Future Studies

The findings from this study suggest potential for future analyses. It would be interesting to learn whether the researchers would receive similar results if all the students in the summer research program were required to submit weekly reflections. There may be commonalities discovered within academic majors and students' classification. Another interesting analysis might occur if students, in addition to submitting weekly reflections, could share their submissions with each other and comment on each other's posts. The establishment of a peer-to-peer forum might promote further a sense of community among the participants, alter what students choose to post, or aid students in recognizing learning processes earlier on through group discussions (Bowman et al., 2016; Hadley, 2007).

Additionally, assessing these results in light of studying another one of Kuh's (2008) high-impact practices through this same lens might be prudent. Whereas this investigation used ePortfolios to analyze the learning of student researchers, an additional inquiry could employ ePortfolios to study the outcomes of students participating in internships, service learning, or study abroad experiences. Adding supplemental measurement tools, such as a pre-post survey, would also add depth to this analysis.

Conclusion

This study allowed for the researchers to gain in-depth, qualitative information on the progress of a select group of student summer researchers. Garnering information from students while their educational experiences were taking place in real time was enlightening. The ePortfolios conveyed how the students were answering their research questions, grappling with their projects, and developing relationships with their faculty mentors. Just as students prosper from opportunities for self-reflection to guide their educational path, faculty and staff also benefit

from analyzing the learning outcomes and experiences of students. Studies in this vein are pivotal for administrators to understand better the dynamic needs of 21st-century learners and to make necessary refinements to program delivery and assessment.

References

- Association of American Colleges and Universities (AAC&U). (2009). *Creative thinking VALUE rubric*. Retrieved from <https://www.aacu.org/value/rubrics/creative-thinking>
- Association of American Colleges & Universities (AAC&U). (2013). *High impact practices*. Retrieved from <https://www.aacu.org/resources/high-impact-practices>
- Barrett, H. C. (2007). Researching electronic portfolios and learner engagement: The REFLECT initiative. *Journal of Adolescent & Adult Literacy*, 50(6), 436-449. doi:10.1598/JAAL.50.6.2
- Bass, R. (2014). The next whole thing in higher education. *Peer Review*, 16(1), 35-36. Retrieved from <https://www.aacu.org/publications-research/periodicals/next-whole-thing-higher-education>
- Bokser, J. A., Brown, S., Chaden, C., Moore, M., Cleary, M. N., Reed, S., . . . Wozniak, K. (2016). Finding common ground: Identifying and eliciting metacognition in ePortfolios across contexts. *International Journal of ePortfolio*, 6(1), 33-44. Retrieved from <http://www.theijep.com/pdf/IJEP211.pdf>
- Bonet, G., & Walters, B. R. (2016). High impact practices: Student engagement and retention. *College Student Journal*, 50(2), 224-235. Retrieved from http://academicworks.cuny.edu/kb_pubs/102/
- Boud, D. (2001). Using journal writing to enhance reflective practice. *New Directions for Adult and Continuing Education*, 90, 9-18. doi:10.1002/ace.16
- Bowman, J., Lowe, B. J., Sabourin, K., & Sweet, C. S. (2016). The use of ePortfolios to support metacognitive practice in a first-year writing program. *International Journal of ePortfolio*, 6(1), 1-22. Retrieved from <http://www.theijep.com/pdf/IJEP221.pdf>
- Brownell, J. E., & Swaner, L. E. (2009). High-impact practices: Applying the learning outcomes literature to the development of successful campus programs. *Peer Review*, 11(2), 26-30.
- Bryant, L. H., & Chittum, J. R. (2013). ePortfolio effectiveness: A(n ill-fated) search for empirical support. *International Journal of ePortfolio*, 3(2), 189-198. Retrieved from <http://www.theijep.com/pdf/IJEP108.pdf>
- Buyarski, C. (2014). *Reflection in the first year: A foundation for identity and meaning-making*. Retrieved from <http://iupui.mcncr.org/ref-practice/>

- Buyarski, C. A., Aaron, R. W., Hansen, M. J., Hollingsworth, C. D., Johnson, C. A., Kahn, S., . . . Powell, A. A. (2015). Purpose and pedagogy: A conceptual model for an ePortfolio. *Theory into Practice*, 54(4), 283-291. doi:10.1080/00405841.2015.1076691
- Cambridge, B. (2007). Learning, knowing, and reflecting: Literacies for the 21st century. *International Journal for the Scholarship of Teaching and Learning*, 1(2), Article 2. Retrieved from <http://digitalcommons.georgiasouthern.edu/cgi/viewcontent.cgi?article=1037&context=ij-sotl>
- Cheng, G., & Chau, J. (2013). Exploring the relationship between students' self-regulated learning ability and their ePortfolio achievement. *Internet and Higher Education*, 17, 9-15. doi:10.1016/j.iheduc.2012.09.005
- Copeland, W. D., Birmingham, C., de la Cruz, E., & Lewin, B. (1993). The reflective practitioner in teaching: Toward a research agenda. *Teaching and Teacher Education*, 9(4), 347-359. doi:10.1016/0742-051X(93)90002-X
- Corbin, J., & Strauss, A. (2015). *Basics of qualitative research: Techniques and procedures for developing grounded theory* (3rd ed.). Thousand Oaks, CA: SAGE.
- Dewey, J. (1938). *Experience & education*. New York, NY: Free Press.
- Drury, M. (2006). E-portfolios—an effective tool? *Universitas*, 2(2), 1-7. Retrieved from http://www.uni.edu/universitas/archive/fall06/pdf/art_drury.pdf
- Eyler, J. (2009). The power of experiential education. *Liberal Education*, 95(4), 24-31.
- Eynon, B., Gambino, L. M., & Török, J. (2014). What difference can ePortfolio make? A field report from the connect to learning project. *International Journal of ePortfolio*, 4(1), 95-114. Retrieved from <http://www.theijep.com/pdf/IJEP127.pdf>
- Eynon, B., & Gambino, L. (2017). *High-impact ePortfolio practice: A catalyst for student, faculty, and institutional learning*. Sterling, VA: Stylus.
- Hadley, N. J. (2007). The portfolio forum: Power in reflection. *Journal of Educational Technology Systems*, 35(4), 449-455. doi:10.2190/C521-U100-535U-7626
- Hansen, M. J., Graunke, S. S., & Thorington Springer, J. (2016). *Assessing high-impact practices and RISE experiences*. Paper presented at the Indiana Association for Institutional Research Annual Conference, Indianapolis, IN. Retrieved from https://irds.iupui.edu/_documents/reports-presentations/conference-presentations/inair/2016%20-%20IUPUI%20High-Impact%20Practices%20and%20RISE%20Assessment.pdf
- Hatton, N., & Smith, D. (1995). Reflection in teacher education: Towards definition and implementation. *Teaching and Teacher Education*, 11(1), 33-49. doi:10.1016/0742-051X(94)00012-U
- Heinrich, B., & Rivera, J. (2017). A method for assessing experiential learning for ePortfolios. *International Journal on Innovations in Online Education*, 1(1). Retrieved from <http://onlineinnovationsjournal.com/download/75dcf5975f8785f7.pdf>
- Hubert, D., Pickavance, J., & Hyberger, A. (2015). Reflective e-portfolios: One HIP to rule them all? *Peer Review*, 17(4). Retrieved from <http://www.aacu.org/peerreview/2015/fall/hubert>
- Jarmon, L., Traphagan, T., Mayrath, M., & Trivedi, A. (2009). Virtual world teaching, experiential learning, and assessment: An interdisciplinary communication course in second life. *Computers and Education*, 53, 169-182. doi:10.1016/j.compedu.2009.01.010
- Johnsen, H. L. (2012). Making learning visible with ePortfolios: Coupling the right pedagogy with the right technology. *International Journal of ePortfolio*, 2(2), 139-148. Retrieved from www.theijep.com/pdf/ijep84.pdf
- Kahn, S. (2014). E-portfolios: A look at where we've been, where we are now, and where we're (possibly) going. *Peer Review*, 16(1). Retrieved from <http://aacu.org/publications-research/periodicals/e-portfolios-look-where-weve-been-where-we-are-now-and-where-were>
- Kahn, S., & Scott, S. (2013). *Scaling up ePortfolios at a complex urban research university: The IUPUI story*. Retrieved from <http://iupui.mcncr.org/scaling-story/#catalyst-and-connector>
- Kolb, D. A. (1984). *Experiential learning: Experience as the source of learning and development*. Englewood Cliffs, NJ: Prentice Hall.
- Kolb, A. Y., & Kolb, D. A. (2005). Learning styles and learning spaces: Enhancing experiential learning in higher education. *Academy of Management Learning & Education*, 4(2), 193-212. doi:10.5465/AMLE.2005.17268566
- Kuh, G. D. (2017). Foreword: And now there are 11. In B. Eynon, L. M. Gambino, G. D. Kuh (Eds.), *High-impact ePortfolio practice: A catalyst for student, faculty, and institutional learning* (1st ed., pp. vii-xi). Sterling, VA: Stylus.
- Kuh, G. D. (2008). *High-impact educational practices: What they are, who has access to them, and why they matter*. Washington, DC: Association of American Colleges and Universities.
- Landis, C. M., Scott, S. B., & Kahn, S. (2015). Examining the role of reflection in ePortfolios: A case study. *International Journal of ePortfolio*, 5(2), 107-121. Retrieved from www.theijep.com/pdf/IJEP168.pdf

- McWhorter, R. R., Delello, J. A., Roberts, P. B., Raisor, C. M., & Fowler, D. A. (2013). A cross-case analysis of the use of web-based ePortfolios in higher education. *Journal of Information Technology Education, 12*, 253-286. Retrieved from <http://www.jite.informingscience.org/documents/Vol12/JITEv12IIPp253-286McWhorter1238.pdf>
- Miettinen, R. (2000). The concept of experiential learning and John Dewey's theory of reflective thought and action. *International Journal of Lifelong Education, 19*(1), 54-72. doi:10.1080/026013700293458
- Morreale, C., & Zile-Tamsen, V., Emerson, C. A., & Herzog, M. (2017). Thinking skills by design: Using a capstone ePortfolio to promote reflection, critical thinking, and curriculum integration. *International Journal of ePortfolio, 7*(1), 13-28. Retrieved from <http://www.theijep.com/pdf/IJEP245.pdf>
- O'Keeffe, M., & Donnelly, R. (2013). Exploration of ePortfolios for adding value and deepening student learning in contemporary higher education. *International Journal of ePortfolio, 3*(1), 1-11. Retrieved from <http://www.theijep.com/pdf/IJEP92.pdf>
- Patton, M. Q. (2015). *Qualitative research and evaluation methods* (4th ed.). Thousand Oaks, CA: SAGE.
- Pearson, D. J., & Heywood, P. (2004). Portfolio use in general practice vocational training: A survey of GP registrars. *Medical Education, 38*(1), 87-95. doi:10.1111/j.1365-2923.2004.01737.x
- Peet, M., Lonn, S., Gurin, P., Boyer, K. P., Matney, M., Marra, T., . . . Daley, A. (2011). Fostering integrative knowledge through ePortfolios. *International Journal of ePortfolio, 1*(1), 11-31. Retrieved from <http://www.theijep.com/pdf/IJEP39.pdf>
- Penny Light, T., Chen, H. L., & Ittelson, J. C. (2012). *Documenting learning with ePortfolios: A guide for college instructors*. San Francisco, CA: Jossey-Bass.
- Reynolds, C., & Patton, J. (2014). *Leveraging the ePortfolio for integrative learning*. Sterling, VA: Stylus.
- Rogers, R. R. (2001). Reflection in higher education: A concept analysis. *Innovative Higher Education, 26*(1), 37-57. doi:10.1023/A:1010986404527
- Ryan, M. (2013). The pedagogical balancing act: Teaching reflection in higher education. *Teaching in Higher Education, 18*(2), 144-155. doi:10.1080/13562517.2012.694104
- Singer-Freeman, K., Bastone, L., & Skrivanek, J. (2016). Using ePortfolios to assess applied and collaborative learning and academic identity in a summer research program for community college students. *International Journal of ePortfolio, 6*(1), 45-57. Retrieved from <http://www.theijep.com/pdf/IJEP202.pdf>
- Strauss, A., & Corbin, J. (1990). *Basics of qualitative research: Grounded theory procedures and techniques*. Newbury Park, CA: SAGE.
- Sweat, J., Jones, G., Han, S., & Wolfgram, S. M. (2013). How does high impact practice predict student engagement? A comparison of white and minority students. *International Journal for the Scholarship of Teaching and Learning, 7*(2), Article 17. doi:10.20429/ijstl.2013.070217
- Watson, C. E., Kuh, G. D., Rhodes, T., Light, T. P., & Chen, H. L. (2016). ePortfolios: The eleventh high impact practice. *International Journal, 6*(2), 65-69. Retrieved from <http://www.theijep.com/pdf/IJEP254.pdf>
- Yancey, K. B. (2009). Electronic portfolios a decade into the twenty-first century: What we know, what we need to know. *Peer Review, 11*(1), 28-32. Retrieved from <https://www.aacu.org/publicationsresearch/periodicals/electronic-portfolios-decadetwenty-first-century-what-we-know>
- Zubizarreta, J. (2009). *The learning portfolio: Reflective practice for improving student learning*. San Francisco, CA: John Wiley & Sons.

KAREN WEBER, EdD, Assistant Dean of Co-Curricular Programs at the Honors College, University of Houston, has served as an administrator within honors education for over 13 years. Currently, Karen supports co-curricular and experiential learning opportunities within the Honors College. Her portfolio includes working with staff and faculty to develop, coordinate, and evaluate experiences that complement the curriculum, including undergraduate research, service learning, and nationally competitive scholarships. She is also overseeing a grant from the Andrew W. Mellon Foundation to establish an undergraduate research program in the humanities. She manages the Honors ePortfolio program and teaches an ePortfolio course at the university. She enjoys consulting with faculty and staff across the university on incorporating ePortfolios into their academic programs. Karen's research interests include analyzing ePortfolios for student learning, advising, and preparing students for the workforce as well as studying co-curricular programs, high-impact practices, and experiential learning opportunities within higher education. She has presented at AAEEBL on using ePortfolios to prepare students for the 21st century workforce and integrating ePortfolios into the university. Karen has received four university-wide staff awards during her tenure at the University of Houston.

KERI MYRICK is pursuing a PhD in Higher Education Leadership and Policy Studies at the University of

Houston. Her current research considers the relationship between high-impact/experiential-learning (HIEL) activities and persistence in historically under-represented minority student groups. Her other interests include identity development in undocumented student populations, reflective practice and personal accountability, and HIEL approaches with students of low socioeconomic status. Ms. Myrick recently presented at the Association for the Study of Higher Education's Annual Conference on *The Promise of Experiential Learning for Disadvantaged Populations*. In her role as Director of Special Programs in the Honors College, Ms. Myrick serves on the Committee for Study- and Service-Abroad/Away in the Honors College and is the faculty adviser for several co-

curricular programs, including Model Arab League and Model G20-Summit. She has participated in three research fellowships to the Middle East, where she examined public K-20 education in Bahrain, Qatar, Oman, and the United Arab Emirates. Ms. Myrick is also the director of the University's Phi Beta Kappa and Phi Kappa Phi chapters, liaison for the Honors College Advisory Board, and former chair of the Staff Council's Events Committee.

Acknowledgements

The contents of this article were featured at AAC&U's 9th Annual Forum on Digital Learning and ePortfolios on January 27, 2018 in Washington, DC.

Appendix

Focus Group Questions

Focus Group - Session One

The majority of the first session comprised a guided tutorial on how to build an ePortfolio.

1. Do you have prior experience building a website?
2. What are your expectations for building and using an ePortfolio this summer?
3. What do you anticipate will be challenging?
4. What do you anticipate will be valuable or beneficial?
5. How do you plan to use your ePortfolio *during* the summer research program?
6. How do you plan to use your ePortfolio *after* the summer research program?

Focus Group - Session Two

1. How are you using your ePortfolio?
2. What are you uploading on your website in addition to what you have shared with me each week?
3. What have you learned from using your ePortfolio?
4. What are the benefits of building an ePortfolio?
5. What are drawbacks of using an ePortfolio?
6. Thus far is this a useful tool. If so, how is it useful? If not, why?

Focus Group - Session Three

1. Overall, how would you assess your experience in building an ePortfolio?
2. What have you learned from using your ePortfolio?
3. What are the benefits of building an ePortfolio?
4. What are drawbacks of using an ePortfolio?
5. What did you learn about yourself through developing an ePortfolio?
6. What did you learn about your research through developing an ePortfolio?
7. Was there anything you gained from building and populating your website that you would not have learned otherwise?
8. What is the value of reflection?
9. How was using a digital platform for reflection more or less beneficial than in-print journal writing or sketch booking?
10. Would you have liked an opportunity to share your reflections with the other participants throughout the study?
11. Would you recommend other students build a website while conducting research? Why or why not?

The Theory-to-Practice ePortfolio: An Assignment to Facilitate Motivation and Higher Order Thinking

Jessica R. Chittum
East Carolina University

Instructors often use ePortfolios to facilitate deeper learning by providing an outlet for reflection, analysis, integrative thinking, and transfer of learning (Buyarski et al., 2015; Reynolds & Patton, 2014). In line with these objectives, I sought out to deepen learning and motivation on a required, semester-long assignment in an introductory educational psychology course for preservice teachers that is linked to a practicum experience. The original assignment was a template in Microsoft Word in which students included a summary of each major theory learned in class, provided a teaching example, and wrote a reflection about each topic. The new assignment is titled the Theory-to-Practice (T2P) ePortfolio, given that the focus of the assignment was to serve as a venue through which students developed an understanding of how the theories they learned in class connected meaningfully to teaching and influenced their teaching philosophy. Thus, the assignment served as a portfolio of this development. Independent samples t tests revealed that students' perceptions of usefulness in the course were significantly higher in the intervention groups and that ePortfolio assignment grades were significantly higher in the intervention groups. The assignment rubrics included dimensions from AAC&U VALUE rubrics measuring integrative learning, critical thinking, analysis, and written communication. The change in assignment format was positively associated with deeper learning on the assignment and perceived value in the larger course experience.

ePortfolio is purported to function as a vessel for integrative and deeper learning (Reynolds & Patton, 2014) by providing a technological means through which those processes can be achieved that may not otherwise be facilitated through paper-based or word-processed assignments (Labissiere & Reynolds, 2004). Others have highlighted the need for instructors in higher education to incorporate and appropriately assess assignments designed to facilitate higher order thinking (Sullivan & McConnell, 2017). Moreover, not only does it seem timely to integrate such tools into one's practice to affect student outcomes but also it is important to study empirically the impact of one's efforts. Although the field of ePortfolio has a growing foundation in peer-reviewed literature dating back to the early 2000s, a minority of the publications has focused on empirically measuring student outcomes (Bryant & Chittum, 2013; Chittum, 2016). Most of the peer-reviewed publications are descriptive in nature or investigate student and/or faculty perceptions and affect associated with ePortfolio rather than how ePortfolio has supported students in the learning environment on a variety of important outcomes (Bryant & Chittum, 2013; Chittum, 2016). Thus, there is a need to develop a more robust research foundation surrounding this educational tool (Bryant & Chittum, 2013; Chittum, 2016; Rhodes, Chen, Watson, & Garrison, 2014).

The purpose of this research was to investigate the impact of altering my teaching practice in a teacher education course by reformatting a traditional Word-processed assignment into a semester-long ePortfolio assignment. To ascertain impact, I investigated students' perceptions of motivation in the course at large (not on the assignment) and their achievement on

the assignment, as measured by a rubric that primarily assessed higher order thinking processes. I chose to measure impact in these ways because my objective in revising the assignment was to impact student motivation more broadly than on a specific assignment and to deepen the thinking processes demonstrated on an assignment worth a large percentage of the course grade and considered a capstone assignment in the course. This study is one example of how an instructor can engage in the scholarship of teaching and learning (SoTL) to inform her practice and, thus, engage in a science-based instructional practice.

ePortfolio in Teacher Preparation

This study concerns a course in a teacher preparation program for elementary education majors, so it is also important to consider this study in context. Research investigating the use of ePortfolios in teacher preparation programs to date has primarily focused on student perceptions of ePortfolios (Chye, Liao, & Liu, 2013; Kabilan & Khan, 2012; Contreras-Higuera, Martínez-Olmo, José Rubio-Hurtado, & Vilà-Bañós, 2016; Kecik et al., 2012; Lambe, McNair, & Smith, 2013; Milman, 2005; Ndoye & Ritzhapt, 2012; Ng, Shroff, & Lim, 2013; Ntuli, Keengwe, & Kyei-Blankson, 2009; Sarai & Sithole, 2012; Struyven, Blicke, & De Roeck, 2014; van Wyk, 2017) and/or their reflective practice as an outcome (e.g., Liu, 2017; Pelliccione & Raison, 2009; Pianpeng, & Koraneekij, 2016; Thomas & Liu, 2012), with many of the ePortfolios situated program-wide as a means to assess teacher competencies. This study differs from prior research in two main ways: (a) my design of the

ePortfolio is situated in a single course, and (b) the intent was to assess the impact on learning/achievement and motivation in a course for preservice teachers. In essence, I examined how transforming an assignment focused on deepening student learning and integration of course content into practice affects student outcomes like achievement and motivation.

Theoretical Framework

MUSIC Model of Motivation

One purpose of this research is to study the effect of modifying a semester-long assignment on student motivation in the course as a whole. I used the MUSIC Model of Motivation (Jones, 2009, 2015) as a theoretical framework for investigating motivation in this study. The MUSIC model was designed to support educators in developing teaching strategies consistent with motivation theory (Jones, 2009). The MUSIC model is a framework that summarizes five components of motivation that are derived from decades of research and theory: *e*Mpowerment, Usefulness, Success, Interest, and Caring (“MUSIC” is an acronym). The main tenants of the MUSIC model are that students are motivated when (a) they believe that they are *empowered* or have some control over their educational environment, (b) they perceive that the content or tasks completed in school are *useful* to them, (c) they feel that *success* is possible if they put forth effort, (d) they perceive that what they are learning or the activities and tasks are *interesting* to them, and (e) they believe that the instructor and their peers in the classroom *care* about them (Jones, 2009).

The five components of the MUSIC Model of Motivation are not “new” concepts; they are organizing factors designed to support educators in using longstanding theories of motivation while reducing jargon, such as expectancy-value theory (Eccles et al., 1983; Wigfield & Eccles, 2000), self-determination theory (Deci & Ryan, 2000), social cognitive theory (Bandura, 1986), self-theories of intelligence and growth/fixed mindsets (Dweck, 1999), interest development theories (Hidi & Renninger, 2006), and the concept of caring (Wentzel, 1997; Noddings, 1992). Table 1 outlines the MUSIC model definitions, related motivation constructs, and associated sources.

For the *empowerment* component, college educators may provide students with autonomy (Deci & Ryan, 1991) and foster an internal locus of causality (deCharms, 1968) by offering students choices and control within the learning environment (Jones, 2009, 2015). When addressing the usefulness construct, instructional strategies may be designed to highlight

the usefulness and relevance of the content to the students’ long- and short-term goals and needs, as well as connect content and tasks to the real world outside of the classroom (Jones, 2009, 2015). To encourage success, college instructors may create environments in which students feel that they can attain success with effort (i.e., an appropriate challenge), including, for example, clear expectations, opportunities for support, and feedback that is positive, constructive, actionable, and informative (Jones, 2009, 2015). Instructors can target students’ interest perceptions by tailoring content, tasks, and activities that are, for example, engaging, enjoyable, novel, stimulating, and presented in a variety of formats (Jones, 2009). Finally, to nurture the caring component, college instructors can foster an environment in which students feel others care about their personal well-being and academic success, which can be facilitated through interpersonal interactions such as respect, tailored feedback, and accommodations (Jones, 2009, 2015).

Deepening Student Learning

A primary objective in my course, and of the ePortfolio assignment revision, was to deepen students’ learning processes. Thus, it is key to first define what I mean by “deepen” learning. In general, in this article, I am referring to *higher order thinking processes*, which are used in this paper as a broader term that encompasses multiple complex thought processes such as critical thinking, transfer, and problem solving (Brookhart, 2010; Halpern, 2006, 2014). Scholars have offered a variety of definitions of these terms; thus, I present definitions of critical thinking and higher order thinking that communicate my objectives in the current study. For example, Lewis and Smith (1993) explained, “higher order thinking occurs when a person takes new information and information stored in memory and interrelates and/or rearranges and extends this information to achieve a purpose or find possible answers in perplexing situations” (p. 136). Halpern (2014) similarly defined critical thinking, explaining that it is “the use of those cognitive skills or strategies that increase the probability of a desirable outcome. It is used to describe thinking that is purposeful, reasoned, and goal-directed” (p. 4). They elaborated further by conveying the thinking processes involved, such as problem solving (Halpern, 2006; Lewis & Smith, 1993), making inferences (Halpern, 2006), decision-making (Halpern, 2006; Lewis & Smith, 1993), formulating predictions (Halpern, 2006; Lewis & Smith, 1993), and creating or synthesizing (Lewis & Smith, 1993). Although they defined two terms (higher order thinking, critical thinking), in both definitions there is an emphasis on achieving a specific goal by

Table 1
The MUSIC Model of Motivation Constructs Defined With Related Constructs

MUSIC model components	Definitions	Related constructs from previous theory and research
Empowerment	Perceived control and/or choices in the learning environment.	Autonomy (Deci & Ryan, 2000) Choice (Patall, 2012)
Usefulness	Perception that the course content or tasks/activities are useful to the student's goals or needs.	Utility value (Wigfield & Eccles, 2000; Eccles et al., 1983) Instrumentality (Miller & Brickman, 2004)
Success	Perception that success can be attained if sufficient effort is put forth.	Expectancy for success (Wigfield & Eccles, 2000) Self-efficacy (Bandura, 1986)
Interest	Perception that the course content, tasks, activities, and/or instruction are interesting.	Situational interest (Hidi & Renninger, 2006) Intrinsic interest value (Wigfield & Eccles, 2000; Eccles et al., 1983) Flow (Csikszentmihalyi, 1990)
Caring	Perceived caring in the learning environment, which includes a belief that the instructor cares about the student's success in the course and his/her personal well-being.	Caring (Noddings, 1992; Wentzel, 1997) Relatedness (Deci & Ryan, 2000)

Note. Adapted from Jones (2016, p. 5).

manipulating information cognitively in a more complex fashion (e.g., through the transfer of learning; Halpern, 2006). These thinking processes encompass the upper levels of Bloom's Cognitive Taxonomy, including analysis, evaluation, and synthesis (Bloom, Englehart, Furst, Hill, & Krathwohl, 1956).

Also central to the present study are the Association of American Colleges and Universities' (AAC&U) definitions of several higher order processes in their VALUE (Valid Assessment of Learning in Undergraduate Education) rubrics (AAC&U, 2017d, 2017e), which were used to measure higher order thinking in the present study: (a) critical thinking, (b) analysis, and (c) integrative learning. AAC&U has put forth a more traditional and specific definition of *critical thinking* as "a habit of mind characterized by the comprehensive exploration of issues, ideas, artifacts, and events before accepting or formulating an opinion or conclusion" (AAC&U, 2017a, para. 2). AAC&U (2017b) defined *analysis* as "the process of breaking complex topics or issues into parts to gain a better understanding of them" (AAC&U, 2017b, para. 2). Finally, *integrative learning* is considered "an understanding and a disposition that a student builds across the curriculum and co-curriculum, from making simple connections among ideas and experiences to synthesizing and transferring learning to new, complex situations within and beyond the campus" (AAC&U, 2017c, para. 2).

Higher order skills such as these are considered critical in higher education. To transfer learning from one context to another, for instance, higher order thinking skills are integral. Indeed, some would argue that transfer is one of the primary purposes of higher education (Halpern & Hakel, 2003). Others suggest that critical thinking and higher order thinking skills are integral to successful professionals in the modern workplace, a need that has been established for several decades (Hunt, 1995; O'Neil, Allred, & Baker, 1997; Pillay, 2006). Hart Research Associates (2015) found that high percentages of the employers they surveyed perceived that problem solving across contexts (96%), solving complex problems (70%), critical thinking and analysis (81%), and application/transfer of learning (80%) were among the most significant learning outcomes for college students entering the workforce. In addition, on average, the surveyed employers did not find many college graduates particularly well-prepared, especially in skills like transfer of learning and critical thinking (Hart Research Associates, 2015).

The Theory-to-Practice ePortfolio

The assignment of focus in this study was implemented in an undergraduate course for preservice teachers that concerned theories of learning, motivation,

and development, as well as planning for instruction. Thus, the course was essentially an introduction to educational psychology with a focus on applying theory and research to instructional practice. The course was “linked” to a practicum in which the students used teaching practices and assignments developed in the educational psychology course (e.g., lesson plans, behavior management procedures) during associated practicum hours in kindergarten through second grade classrooms. The assignment of focus spanned the majority of the semester, and it was designed to support students as they bridged theory and practice. Both versions of the assignment included three main elements: (a) original summaries of the major theories covered in class, (b) teaching examples that indicate how the theories apply to classroom teaching, and (c) personal stances that include reflections and judgments about each theory. The original assignment (i.e., the “Theory Chart”) was a template in Microsoft Word format, which included tables students filled in with appropriate information (Appendix A). All students (control and intervention groups) were offered in-class instructions, writing prompts and samples, and formative feedback on the first summary with an expectation that they would submit a revised version for grading.

Revised Assignment

The revised assignment was titled the Theory-to-Practice (T2P) ePortfolio, given that the focus of the assignment was to serve as a venue through which students developed an understanding of how the theories they learned in class connected meaningfully to teaching and influenced their teaching philosophy. Thus, the T2P ePortfolio operated as a portfolio of this development and can be considered a capstone assignment. With that in mind, the primary objectives of the assignment redesign were to (a) provide an opportunity for the students to create a portfolio of their teaching experience during the semester with a focus on connecting theory to their budding instructional practice, (b) facilitate deeper thinking processes about the theories and concepts covered in class, (c) enable more meaningful connections between the content and practicum experience, and (d) make the assignment more useful to them in the future (edTPA, teaching). I wanted the assignment to be in a format more easily accessible to them in the future because the students have been known to use their Theory Charts during later semesters to assist with some course assignments, for weekly theory-focused reflections during their final internships as senior-level student teachers, and as they complete one section of the edTPA, a performance assessment all students are required to pass before they are recommended for licensure. In previous experience, the Theory Chart as a paper-based assignment has posed some issues for students attempting to use it at a later time.

Digication, an ePortfolio platform, hosted the T2P ePortfolio. Screenshots of the template and examples of student work are visible in Appendix A and Appendix B, and are an illustration of the Classic Digication platform. The following list summarizes features that the Digication platform provided that were not accessible when the assignment was formatted as a Word-based template:

- Staggered deadlines and feedback that occurred throughout the semester, instead of one formative assessment initially followed by a single submission of the Theory Chart at the end of the semester. Staggered deadlines allowed students to work continuously on the assignment throughout the semester. Previously, they generally had worked on the assignment in isolation immediately before the deadline.
- Better integration of the assignment and theory connections with the linked practicum course and teaching experiences, which primarily took place during the latter half of the semester. Thus, the T2P ePortfolio became part of the practicum experience instead of a paper-based assignment associated with the educational psychology course.
- Opportunities for personalization and more complex content through the use of pictures, images, graphic organizers, hyperlinks, videos, specialized formatting, and so forth. Students were able to add, for example, graphic organizers, diagrams, and photos of their practicum students and anchor charts to illustrate their points (e.g., see Appendix B).
- AAC&U VALUE Rubrics embedded into the Digication platform for clear feedback.
- Social interaction among students.
- Integration of other evidences, including a statement of teaching philosophy, which served to further integrate theory and practice through alignment of the content and themes represented in the ePortfolio as a whole.

The T2P ePortfolio meets several goals of integrative ePortfolios, as outlined by Reynolds and Patton (2014, p. 13): it (a) provided an opportunity for the students to demonstrate how well they learned the course content through the theory summaries and teaching examples; (b) offered an opportunity for them to reflect on the theories and their experiences in the classroom through the personal stances/reactions; (c) provided a venue to develop connections among content by showing how the summaries informed the teaching examples, personal stances, and teaching philosophies; (d) afforded a means of identity development through the statements of teaching

Table 2
Reliability and Sample Items

Scale	No. of items	Example item	α
eMpowerment	5	"I have control over how I learn the course content."	.937
Usefulness	5	"I find the coursework to be relevant to my future."	.936
Success	4	"I am confident that I can succeed in the coursework."	.919
Interest	6	"I enjoy the instructional methods used in this course."	.939
Caring	6	"The instructor is respectful of me."	.926

philosophy, personal stances, and teaching examples, which all focused on the students' personal experiences and reflections in and outside of the classroom as preservice teachers and college students.

Research Questions

Given the nature of the T2P ePortfolio in bridging theory and practice more explicitly and inproviding a venue through which students can connect what they learned in the course to their practical experiences, I developed the following research questions:

- RQ1: Can reframing a major course assignment as an ePortfolio impact student motivation in a course?
- RQ2: Can reframing a major course assignment as an ePortfolio affect student achievement on an assignment, as measured by a rubric assessing higher order thinking?

I hypothesized that the students' motivation for the course as a whole might be affected in terms of their perceived usefulness due to the T2P ePortfolio's focus on bridging theory and practice. In addition, I hypothesized that their grades on the assignment would be higher in the intervention group because the T2P ePortfolio was designed to facilitate deeper, more meaningful connections than the format the Theory Chart allowed.

Methodology

Participants

The participants in this study include a convenience sample of four course sections of undergraduate students enrolled in a junior-level teacher preparation course focused on learning theories (essentially, an introduction to educational psychology). All students were enrolled in an Elementary Education teacher preparation program in a large public university in the Eastern US. There were a total of 93 participants: two course sections participated as the control group ($n = 50$) and two course sections comprised the intervention group ($n = 43$). The same instructor taught

all four course sections. Of the 93 participants, the majority were female (93.5%) and most identified as White (79.6%). The remainder of the students identified as Black or African American (16.1%) or Hispanic or Latino (4.3%). The reported demographics in this sample are representative of the program's demographics. Previous research indicates that the larger elementary education workforce is similarly predominately female (Goldring, Gray, & Bitterman, 2013). Chi-square tests were used to analyze any differences in demographics between the experimental groups. Results indicated no significant differences in race ($\chi^2 [3] = 7.740, p = .052$) or gender ($\chi^2 [1] = .056, p = .814$) between the control and intervention groups. Students were either enrolled by their advisors or chose to enroll in the course during mandatory enrollment periods each semester.

Measures

To measure perceived motivation in the course, I used the MUSIC Model of Academic Motivation Inventory-College Student Version (Jones, 2016). The MUSIC Inventory includes five scales: one for each component of the model. Example items can be found in Table 2, and the full survey can be accessed via Jones (2016). The survey measures students' motivation for the course rather than a specific assignment or aspect of the course. This was intentional because my objective was to investigate the presence of significant differences in overall motivation in the course following adjustments to one part of my instructional practice, albeit an assignment that spans the semester. The MUSIC Inventory has been found to be valid and reliable with college level students in a variety of disciplines (Jones & Skaggs, 2016), and factor analyses suggest that students at many levels and in multiple domains perceive each MUSIC component as a separate construct (Chittum & Jones, 2017; Jones & Skaggs, 2016; Jones & Wilkins, 2013). Cronbach's alpha coefficients indicate acceptable reliability among each measure in the present study (Table 2).

I measured the impact on student achievement of the assignment through the use of adapted VALUE rubrics developed by AAC&U (2017d, 2017e). Because my goal

Table 3
Intercorrelations and Descriptive Statistics

	1	2	3	4	5	6
1. Empowerment	–					
2. Usefulness	.679**	–				
3. Success	.751**	.672**	–			
4. Interest	.761**	.805**	.767**	–		
5. Caring	.560**	.656**	.544**	.655**	–	
6. Grade	.012	.056	.118	-.023	-.074	–
<i>M (SD)</i>	4.81 (0.94)	5.36 (0.66)	4.98 (0.87)	4.99 (0.81)	5.50 (0.64)	86.59 (9.37)

Note. Grade $n = 93$. MUSIC model variables $n = 91$.

** $p < .01$ (2-tailed).

* $p < .05$ (2-tailed).

was to aid students in deepening their learning through the revised assignment, I used specific dimensions (rows) from the Integrative Learning, Critical Thinking, Inquiry and Analysis, and Written Communication VALUE rubrics and adapted them for this purpose (AAC&U, 2017a, 2017b, 2017c). I developed three rubrics, one for each main section of the assignment: (a) theory summaries, (b) teaching examples, and (c) personal stances. As in the VALUE rubrics, the adapted rubrics were graded using the same four criteria 1 (*benchmark*), 2 (*milestone*), 3 (*milestone*), 4 (*capstone*). Each student's grades on the three rubrics were averaged to create a composite T2P ePortfolio grade.

Procedures

This research study was approved by my Institutional Review Board. All major aspects of the course remained the same except for the changes in the assignment format from the Theory Chart to the T2P ePortfolio. Some similarities persisted between those assignments. Both the control and intervention group were given prompts to guide their work on each part of the assignment. There were minor differences in the prompts when the format changed; however, the presentation in class and the information provided were much the same. Expectations for content and depth of thought were communicated similarly in each course section, except that students in the intervention group also had access to the assignment rubric on the course's learning management system, Blackboard. However, anecdotal evidence suggests that students in the intervention group rarely made it a practice to examine the rubric before submitting assignments in Digication.

The intervention group was introduced to the Digication platform near the beginning of the semester. Their first summaries of the theories were due within weeks of the initial lectures, which would begin a stream of staggered deadlines that spanned the semester. Students in the intervention group submitted their work within the Digication platform throughout the semester, where it was

graded using embedded rubrics. In the control group, the Theory Chart summaries, teaching examples, and personal stances were all due at one time at the end of the semester in Blackboard. In working with the intervention group, troubleshooting technology and submissions took place throughout the semester, and instructions for how to submit, edit, and otherwise work within the Digication platform were provided to students via Blackboard. Finally, students completed the MUSIC Inventory on Qualtrics near the end of the semester. They were offered minimal course credit for completing the survey.

Results

A rubric score on the assignment was available for all participants ($N = 93$). However, two students did not complete the MUSIC Inventory ($n = 91$). On average, the students in the control and intervention groups performed fairly well on the theory assignments (Tables 3 and 4). This program used a 7-point grading scale; thus, an average assignment grade of 86.59% for both groups would be a B-. The control group averaged a C grade (82.41%), and the intervention group averaged a B+ grade (91.45%). Both groups appeared to be motivated in the course (Tables 3 and 4), as their average ratings on the MUSIC components ranged from the upper 4s (4 = *somewhat agree*) and between 5 (*agree*) and 6 (*strongly agree*).

Pearson correlation coefficients for the measured variables are in Table 3. Assignment grade correlated weakly with all five MUSIC components, suggesting little association between the assignment grade and their motivation for the course. The correlation coefficients among the five MUSIC variables ranged from .544 to .805, indicating moderate to strong relationships among those motivation-related perceptions, which is consistent with previous research (Chittum & Jones, 2017; Jones & Skaggs, 2016).

I performed independent samples t tests to compare the five MUSIC model components and assignment

Table 4
t Test Results

Scale	<i>t</i>	<i>df</i>	<i>M</i> diff.	<i>M</i> control	<i>M</i> intervention
Empowerment	-0.116	89	-0.023	4.80	4.82
Usefulness	-2.140*	87.33	-0.286	5.23	5.52
Success	-1.483	87.92	-0.315	4.86	5.13
Interest	-1.226	89	-0.218	4.89	5.10
Caring	-0.085	89	-0.205	5.50	5.51
Grade	-5.274**	91	-9.04 (%)	82.41 (%)	91.45 (%)

Note. Grade $n = 93$. MUSIC model variables $n = 91$. I graded all Theory Charts and T2P ePortfolios using the same rubric focused on content, integrative learning, critical thinking, analysis, and written communication.

* $p < .05$.

** $p < .001$.

grades between the control group (Theory Chart) and the intervention group (T2P ePortfolio). Results indicate that perceived usefulness and assignment grades were both significantly higher in the intervention group (Table 4). As expected, perceived empowerment, success, interest, and caring were similar in the control and intervention groups.

Given that I was working with a convenience sample and thus limited to a specific sample size based on students enrolled in my course sections, I computed a post hoc power analysis using G*Power (Faul, Erdfelder, Lang, & Buchner, 2007) to determine effect size. Post hoc calculations indicated high effect for usefulness ($d = .55$) and grade ($d = .99$). According to Cohen (1988) an effect size of .10 implies a small effect, .30 is medium, and .50 is high. In addition, Lipsey and Wilson's (1993) meta-analysis also suggested that an effect size of .50 is sufficient in social science research, indicating that an effect of .55 for usefulness is adequate power.

Discussion

This study extends research focused on the impact of ePortfolio-based instruction on student outcomes, which is a need-area in the current literature (Bryant & Chittum, 2013; Chittum, 2016; Rhodes et al., 2014). Moreover, this study fills a gap in research on preservice teachers by examining student outcomes beyond reflective practice and student teacher perceptions of ePortfolios.

Concerning the first research question, "Can reframing a major course assignment as an ePortfolio impact student motivation in a course?", independent samples *t* test results indicated that students' perceptions of usefulness in the course were significantly increased in the T2P ePortfolio group. Thus, the revised assignment format may have contributed to increasing perceptions of the value of the course content as it is applied to teaching in elementary

grades classrooms (e.g., via the practicum course) and the students' personal goals, which likely align with elementary teaching. Usefulness or utility value concerns feeling motivated to engage in a task because it relates to a future goal (Wigfield & Eccles, 2000) or understanding why the task and/or content is relevant or important (Jones, 2009). The T2P ePortfolio was designed to more discernibly bridge theory and instructional practice between a linked introductory educational psychology course and a practicum experience for education majors whose goal it was to become teachers. Thus, the technology appears to have provided a conduit through which students' perceived usefulness of the content could cultivate. These findings are consistent with an adult learning perspective that emphasizes the importance of perceived relevance to one's goals and life (Knowles, Holton, & Swanson, 2005). Indeed, Knowles et al. (2005) posited that one of the foremost principles in andragogy is that "adults need to know why they need to learn something before undertaking to learn it" (p. 199), which was inherent to the structure and function of the T2P ePortfolio.

To address the second research question, "Can reframing a major course assignment as an ePortfolio affect student achievement on an assignment, as measured by a rubric assessing higher order thinking?", independent samples *t* tests revealed students' assignment grades were significantly higher in the intervention groups. The rubrics used to grade the assignment measured content development, integrative learning, critical thinking, analysis, and written communication; thus, significantly higher grades in the intervention group suggest demonstrated improvements in higher order processing. As Wood, Bruner, and Ross (1976) noted, recognizing a problem and the solution to the problem is necessary before one is able to engage independently in the process. The T2P ePortfolio provided students with a venue through which they could define theories and then recognize them in their practice as appropriate instructional practices, solutions,

and labels, given each unique situation in the complex environment that is a modern classroom. In this way, the T2P offered a structured and scaffolded setting for students to consider the theories and apply them in a structured way to their teaching (present and future).

Limitations

There are several limitations to consider. First, demographics were fairly homogeneous in that students who identified as White females comprised the majority of the sample. Although this is representative of the demographics in this particular program of study, the lack of diversity, in addition to a relatively small sample size based on convenience, limits the study's generalizability. It is important to note, however, that the elementary education profession is similarly homogenous in terms of gender (Goldring et al., 2013), if not race.

Second, the effect size for the motivation coefficient was within acceptable limits; nevertheless, an increased sample size would have rendered a higher effect and, thus, more power. Given the self-report nature of the measure, I expected a lower effect of the motivation variable than the grade variable.

Third, although I attempted to control for differences between the control and intervention groups to avoid threats to internal validity, some inconsistencies were unavoidable as time passed. One difference between the two groups is that the control group did not have access to the grading rubrics in advance, even though similar performance expectations were expressed. Anecdotal evidence suggests that most students generally did not examine the rubric before submitting work. Another difference is that, by the nature of the ePortfolio assignment, students in the intervention group were exposed to somewhat more feedback during the semester than the control group due to staggered deadlines. It is important to note that the control and intervention groups had the opportunity to submit a summary for formative assessment prior to submitting any work to be graded, which involved extensive feedback on their first attempt at a summary. In addition, the control group (unlike the intervention group) was given an example summary to reference, which aided their work. I did not provide the example summary for the T2P group because they would have more feedback (and thus examples) throughout the semester. Although there was an imbalance in feedback, I contend that staggered deadlines were a leading attraction of the ePortfolio format. As such, rather than view the differences only as a validity threat, I posit that they represent a deliberate choice made in hopes of eliciting a positive impact.

Other changes were minor and typical to expected fluctuations among classes and semesters. My objective was to avoid major changes so that the study would not

be unduly affected. For example, sometimes course topics were presented in a slightly different order (e.g., one semester, behavioral learning theory and information processing theory switched order). In general, reading and course assignments other than the T2P ePortfolio remained very similar or exactly the same, and the PowerPoint presentations were only subjected to minor tweaks/corrections (if any). It is possible that my teaching improved and/or instructional style changed incrementally during the course of the study; however, the research took place over a relatively short time period (four semesters), so a significant change seems unlikely. Although it is possible that there is a threat to the internal validity of the grade due to instrumentation variations, I posit that there is some additional support for the internal validity of the motivation findings. Statistically similar perceptions of the remaining motivation variables (empowerment, success, interest, caring) imply that other factors in the course were likely similar across these semesters, excepting those that influenced perceived usefulness/relevance. Course revisions and innovations focused on usefulness were deliberately attained through the T2P ePortfolio.

Conclusion

This research suggests that a course-based ePortfolio capstone assignment can positively impact student motivation in relation to students' subjective perceptions of value (usefulness) in the class and their demonstrated higher order thinking processes on the semester-long capstone assignment. The importance of perceived motivation in class has an established foundation in the literature. Students who are more motivated demonstrate more positive outcomes, such as improved performance, persistence, self-perceptions, engagement, and other positive outcomes (Deci & Ryan, 2000; Wigfield & Eccles, 2000). Moreover, in addition to more general calls for college students to mature higher order thinking skills in preparation for the workforce (Hart Research Associates, 2015; Hunt, 1995; O'Neil et al., 1997; Pillay, 2006), there are arguments specific to the need for teachers to develop robust higher order thinking skills. Higher order thinking processes are the basis of much of the curricular shifts in current US education system. For instance, "critical thinking, problem solving, and analytical skills" (Common Core state Standards [CCSS], 2018, para. 2) are integral to the current Common Core Standards. To teach those skills to students, some have posited that preparing educators to be critical thinkers is also important (e.g., Ruenzel, 2014). Educators are prime candidates for becoming fluent higher order thinkers, considering the many moving parts and problems they encounter on a daily basis in their classrooms and schools, much like many other professionals. Overall, this research suggests

that through instructional innovations such as this transformation of an assignment into an ePortfolio, teacher preparation programs may be able to support students in becoming more motivated in class and in developing needed higher order thinking skills on a smaller scale than program-wide, competencies-based ePortfolios.

References

- Association of American Colleges and Universities (AAC&U). (2017a). *Critical thinking VALUE rubric*. Retrieved from <https://www.aacu.org/value/rubrics/critical-thinking>
- Association of American Colleges and Universities (AAC&U). (2017b). *Inquiry and analysis VALUE rubric*. Retrieved from <https://www.aacu.org/value/rubrics/inquiry-analysis>
- Association of American Colleges and Universities (AAC&U). (2017c). *Integrative learning VALUE rubric*. Retrieved from <https://www.aacu.org/value/rubrics/integrative-learning>
- Association of American Colleges and Universities (AAC&U). (2017d). *VALUE rubrics*. Retrieved from <https://www.aacu.org/value-rubrics>
- Association of American Colleges and Universities (AAC&U). (2017e). *VALUE rubric development project*. Retrieved from <https://www.aacu.org/value/rubrics>
- Bloom, B., Englehart, M., Furst, E., Hill, W., & Krathwohl, D. (1956). *Taxonomy of educational objectives, handbook 1: Cognitive domain*. New York, NY: Longmans, Green, and Co.
- Brookhart, S. M. (2010). *How to assess higher-order thinking skills in your classroom*. Alexandria, VA: ASCD.
- Bryant, L. H., & Chittum, J. R. (2013). ePortfolio effectiveness: A(n ill-fated) search for empirical support. *International Journal of ePortfolio*, 3(2), 198-198.
- Buyarski, C. A., Aaron, R. W., Hansen, M., Hollingsworth, C. D., Johnson, C. A., Kahn, S., . . . Powell, A. (2015). Purpose and pedagogy: A conceptual model for an ePortfolio. *Theory Into Practice*, 54(4), 283-291. doi:10.1080/00405841.2015.1076691
- Chittum, J. R. (2016, August). *Pouring the foundation: A look at where we've been and where we're heading with ePortfolio research*. Keynote presentation at the annual meeting of the Association for Authentic, Experiential and Evidence-Based Learning, Boston, MA.
- Chittum, J. R., & Jones, B. D. (2017). Identifying pre-high school students' science class motivation profiles to increase their science identification and persistence. *Journal of Educational Psychology*, 109(8), 1163-1187. doi:10.1037/edu0000176
- Chye, S. Y., Liao, A. K., & Liu, W. C. (2013). Student teachers' motivation and perceptions of e-portfolio in the context of problem-based learning. *Asia-Pacific Education Researcher*, 22(4), 367-375. doi:10.1007/s40299-012-0022-4
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.), Hillsdale, NJ: Erlbaum.
- Common Core state Standards (CCSS). (2018). *What parents should know*. Retrieved from <http://www.corestandards.org/what-parents-should-know/>
- Contreras-Higuera, W. E., Martínez-Olmo, F., José Rubio-Hurtado, M., & Vilà-Bañós, R. (2016). University students' perceptions of e-portfolios and rubrics as combined assessment tools in education courses. *Journal of Educational Computing Research*, 54(1), 85-107. doi:10.1177/0735633115612784
- Csikszentmihalyi, M. (1990). *Flow: The psychology of optimal experience*. New York, NY: Harper & Row.
- deCharms, R. (1968). *Personal causation: The internal affective determinants of behavior*. New York, NY: Academic Press.
- Deci, E. L., & Ryan, R. M. (1991). A motivational approach to self: Integration in personality. In R. Dientsbier (Ed.), *Nebraska symposium on motivation* (Vol. 38). Lincoln, NE: University of Nebraska Press.
- Deci, E. L., & Ryan, R. M. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, 11(4), 227-268. doi:10.1207/S15327965PLI1104_01
- Dweck, C. S. (1999). *Self-theories: Their role in motivation, personality, and development*. Philadelphia, PA: Psychology Press.
- Eccles, J. S., Adler, T. F., Futterman, R., Goff, S. B., Kaczala, C. M., Meece, J. L., & Midgley, C. (1983). Expectancies, values, and academic behaviors. In J. T. Spence (Ed.), *Achievement and achievement motivation* (pp. 75-146). San Francisco, CA: Freeman.
- Faul, F., Erdfelder, E., Buchner, A., & Lang, A.-G. (2009). Statistical power analyses using G*Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods*, 41, 1149-1160.
- Goldring, R., Gray, L., & Bitterman, A. (2013). *Characteristics of public and private elementary and secondary school teachers in the United States: Results from the 2011-12 schools and staffing survey* (NCES 2013-314). U.S. Department of Education. Washington, DC: National Center for Education Statistics. Retrieved from <http://nces.ed.gov/pubsearch>
- Halpern, D. F. (2006). *Thought and knowledge: An introduction to critical thinking* (4th ed.). Mahwah, NJ: Lawrence Earlbaum.
- Halpern, D. F. (2014). *Critical thinking across the curriculum: A brief edition of thought and knowledge*. New York, NY: Routledge.

- Halpern, D. F., & Hakel, M. D. (2003). Applying the science of learning to the university and beyond: Teaching for long-term retention and transfer. *Change*, 35(4), 36-41. doi:10.1080/00091380309604109
- Hart Research Associates. (2015). *Falling short? College learning and career success*. Washington, DC: Author. Retrieved from <https://www.aacu.org/leap/public-opinion-research>
- Hidi, S., & Renninger, K. A. (2006). The four-phase model of interest development. *Educational Psychologist*, 41(2), 111-127. doi:10.1207/s15326985ep4102_4
- Hunt, E. (1995). *Will we be smart enough? A cognitive analysis of the coming workforce*. New York, NY: Sage.
- Jones, B. D. (2009). Motivating students to engage in learning: The MUSIC model of academic motivation. *International Journal of Teaching and Learning in Higher Education*, 21(2), 272-285. Retrieved from <http://www.isetl.org/ijthe/pdf/IJTLHE774.pdf>
- Jones, B. D. (2015). *Motivating students by design: Practical strategies for professors*. Charleston, SC: CreateSpace.
- Jones, B. D. (2016). *User guide for assessing the components of the MUSIC® Model of Academic Motivation*. Retrieved from <http://www.theMUSICmodel.com>
- Jones, B. D., & Skaggs, G. E. (2016). Measuring students' motivation: Validity evidence for the MUSIC Model of Academic Motivation Inventory. *International Journal for the Scholarship of Teaching and Learning*, 10(1). Retrieved from <http://digitalcommons.georgiasouthern.edu/ij-sotl/vol10/iss1/7>
- Jones, B. D., & Wilkins, J. L. M. (2013). Testing the MUSIC Model of Academic Motivation through confirmatory factor analysis. *Educational Psychology: An International Journal of Experimental Educational Psychology*, 33(4), 482-503. doi:10.1080/01443410.2013.785044
- Kabilan, M. K., & Khan, M. A. (2012). Assessing pre-service English language teachers' learning using e-portfolios: Benefits, challenges and competencies gained. *Computers & Education*, 58(4), 1007-1020. doi:10.1016/j.compedu.2011.11.011
- Kecik, I., Aydin, B., Sakar, N., Dikdere, M., Aydin, S., Yuksel, I., & Caner, M. (2012). Determining the feasibility of an e-portfolio application in a distance education teaching practice course. *International Review of Research in Open and Distance Learning*, 13(2), 160-180. Retrieved from <http://www.irrodl.org/index.php/irrodl/article/view/1160>
- Labissière, Y., & Reynolds, C. (2004). Using electronic portfolios as a pedagogical practice to enhance student learning. *Inventio*, 2(6). Retrieved from <https://uiowa.edu/assessment/sites/uiowa.edu.assessment/files/Labissiere.pdf>
- Lambe, J., McNair, V., & Smith, R. (2013). Special educational needs, e-learning and the reflective e-portfolio: implications for developing and assessing competence in pre-service education. *Journal of Education for Teaching: International Research and Pedagogy*, 39(2), 181-196. doi:10.1080/02607476.2013.765191
- Lewis, A., & Smith, D. (1993). Defining higher order thinking. *Theory Into Practice*, 32(3), 313-337.
- Lipsey, M. W., & Wilson, D. B. (1993). The efficacy of psychological, educational, and behavioral treatment: Confirmation from meta-analysis. *American Psychologist*, 48(1), 1181-1209.
- Liu, K. (2017). Creating a dialogic space for prospective teacher critical reflection and transformative learning. *Reflective Practice*, 18(6), 805-820. doi:10.1080/14623943.2017.1361919
- Miller, R. B., & Brickman, S. J. (2004). A model of future-oriented motivation and self-regulation. *Educational Psychology Review*, 16(1), 9-33. doi:10.1023/B:EDPR.0000012343.96370.39
- Milman, N. (2005). Web-based digital teaching portfolios: Fostering reflection and technology competence in preservice teacher education students. *Journal of Technology and Teacher Education*, 13(3), 373-396. Retrieved from <http://www.editlib.org/p/4513>
- Ndoye, A., & Ritzhaupt, A. (2012). Qualitative analysis of student perceptions of e-portfolios in a teacher education program. *Journal of Digital Learning in Teacher Education*, 28(3), 99-107. Retrieved from <http://www.aritzhaupt.com/eprofessional/papers/2012/ParkerNdoyeRitzhaupt.pdf>
- Ng, E. M. W., Shroff, R., & Lim, C. (2013). Applying a modified technology acceptance model to qualitatively analyse the factors affecting e-portfolio implementation for student teachers' in field experience placements. *Issues in Informing Science and Information Technology*, 10, 355-366. Retrieved from <http://iisit.org/Vol10/IISITv10p355-365Ng0115.pdf>
- Noddings, M. (1992). *The challenge to care in schools: An alternative approach to education*. New York, NY: Teachers College Press.
- Ntuli, E., Keengwe, J., & Kyei-Blankson, L. (2009). Electronic portfolios in teacher education: A case study of early childhood teacher candidates. *Early Childhood Education Journal*, 37(2), 121-126. doi:10.1007/s10643-009-0327-y
- O'Brien, K. (2006). ePortfolios as learning construction zones: Provost's perspective. In A. Jafari & C. Kaufman (Eds.), *Handbook of research on ePortfolios* (pp. 74-89). London, UK: Idea Group. doi:10.4018/978-1-59140-890-1.ch008
- O'Neil, H. F., Allred, K., & Baker, E. L. (1997). Review of workforce readiness theoretical

- frameworks. In H. F. O'Neil (Ed.), *Workforce readiness: Competencies and assessment* (pp. 3-25). New York, NY: Psychology Press.
- Patall, E. A. (2012). The motivational complexity of choosing: A review of theory and research. In R. M. Ryan (Ed.), *The Oxford handbook of human motivation* (pp. 248-279). New York, NY: Oxford University Press.
- Pelliccione, L., & Raison, G. (2009). Promoting the scholarship of teaching through reflective e-portfolios in teacher education. *Journal of Education for Teaching*, 35(3), 271-281. doi:10.1080/02607470903092813
- Pianpeng, T., & Koraneekij, P. (2016). Development of a model of reflection using video based on Gibbs's cycle in electronic portfolio to enhance level of reflective thinking of teacher students. *International Journal of Social Science and Humanity*, 6(1), 26-31. doi:10.7763/IJSSH.2016.V6.612
- Pillay, H. (1998). Cognitive skills required in contemporary workplaces. *Studies in Continuing Education*, 20(1), 71-81. doi:10.1080/0158037980200105
- Reynolds, C., & Patton, J. (2014). Leveraging the e-portfolio for integrative learning: A faculty guide to classroom practices for transforming student learning. Sterling, VA: Stylus.
- Rhodes, T., Chen, H. L., Watson, C. E., Garrison, W. (2014). Editorial: A call for more rigorous ePortfolio research. *International Journal of ePortfolio*, 4(1), 1-5. Retrieved from <http://theijep.com/pdf/IJEP144.pdf>
- Ruenzel, D. (2014, March 25). Embracing teachers as critical thinkers. *Education Week*, 33(2), 33. Retrieved from <https://www.edweek.org/ew/articles/2014/03/26/26ruenzel.h33.html>
- Sarai, N., & Sithole, G. (2012). Analysis of the process and outcomes of ePortfolio development to recognise formal learning in Zimbabwe. *Computer and Information Science*, 5(3), 56-66. doi:10.5539/cis.v5n3p56
- Scheffer, B. K., & Rubenfeld, M. G. (2000). A consensus statement on critical thinking in nursing. *Journal of Nursing Education*, 39(8), 352-359.
- Struyven, K., Blicq, Y., & De Roeck, V. (2014). The electronic portfolio as a tool to develop and assess pre-service student teaching competences: Challenges for quality. *Studies in Educational Evaluation*, 43, 40-54. doi:10.1016/j.stueduc.2014.06.001
- Sullivan, D. F., & McConnell, K. D. (2017). Big progress in authentic assessment, but by itself not enough. *Change*, 49(1), 14-25. doi:10.1080/00091383.2017.1265386
- Thomas, M., & Liu, K. (2012). The performance of reflection: A grounded analysis of prospective teachers' ePortfolios. *Journal of Technology and Teacher Education*, 20(3), 305-330. Retrieved from <http://www.editlib.org/p/38513/>
- Van Wyk, M. (2017). Exploring student teachers' views on ePortfolios as an empowering tool to enhance self-directed learning in an online teacher education course. *Australian Journal of Teacher Education*, 42(6), 1-21. Retrieved from ERIC database. (EJ1146282)
- Wentzel, K. R. (1997). Student motivation in middle school: The role of perceived pedagogical caring. *Journal of Educational Psychology*, 89(3), 411-419. doi:10.1037/0022-0663.89.3.411
- Wigfield, A., & Eccles, J. S. (2000). Expectancy-value theory of achievement motivation. *Contemporary Educational Psychology*, 25(1), 68-81. doi:10.1006/ceps.1999.1015
- Wood, D. J., Bruner, J. S., & Ross, G. (1976). The role of tutoring in problem solving. *Journal of Child Psychology and Psychiatry*, 17(2), 89-100. doi:10.1111/j.1469-7610.1976.tb00381.x

JESSICA R. CHITTUM, PhD, is an Assistant Professor of Elementary Education at East Carolina University (ECU). Her research interests involve person-centered research design (e.g., cluster analysis), academic motivation (particularly in STEM fields), ePortfolio, and higher education pedagogy. She currently leads a team in developing and managing an open-access ePortfolio research archive, "PEARL" (Publications on ePortfolio: Archives of the Research Landscape, eportfolio.aacu.org), which is supported by AAC&U and serves as an interactive and collaborative tool for ePortfolio researchers and practitioners. In addition to research, she often teaches two undergraduate teacher preparation courses focused on bridging theory and practice—educational psychology and a practicum experience—and two graduate courses in action research. Before coming to ECU, she completed her doctoral degree in Educational Psychology at Virginia Tech, and a BS in Elementary Education (with an ESOL endorsement) and an MA in Exceptional Student Education from the University of South Florida St. Petersburg. Jessica previously taught in the Florida public school system for 4.5 years as both a special education teacher in a self-contained classroom and a general educational teacher in an inclusive classroom.

Acknowledgements

The author would like to thank Digication for their support of this ePortfolio research project. The contents of this article were featured at AAC&U's 9th Annual Forum on Digital Learning and ePortfolios on January 27, 2018 in Washington, DC.

Appendix A

Assignment Templates

Original Theory Chart Template:

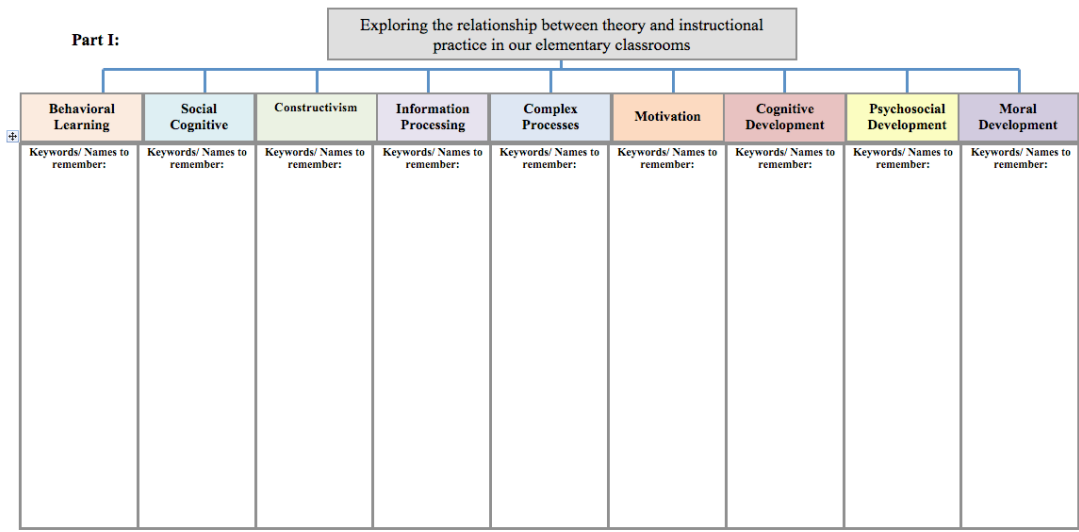
Theory Chart

Exploring the Relationship Between Theory and Instructional Practice

As you read the assigned readings and cover the theories and concepts in class, you may record your notes on the organizer and the chart. Pay special attention to how theory connects with practice in the classroom. *You should begin to identify with the approaches that appeal to you as a teacher-in-training. Everything you write should be in your own words.* You will also submit a Theory Chart Formative Assessment (see the calendar). You can use my feedback from the formative assessment to revise your work and to guide your future work. It is important that you put a lot of effort into this assignment not only because it is worth 10% of your grade in this course but also because you will use it to study for the midterm and final exams.

The graphic organizer (Part I) and the chart (Part II) will need to be completed with all of the theories included below. The final version should be completed and submitted in .doc or .docx format. Work on this template in Microsoft Word throughout the process.

Part I:

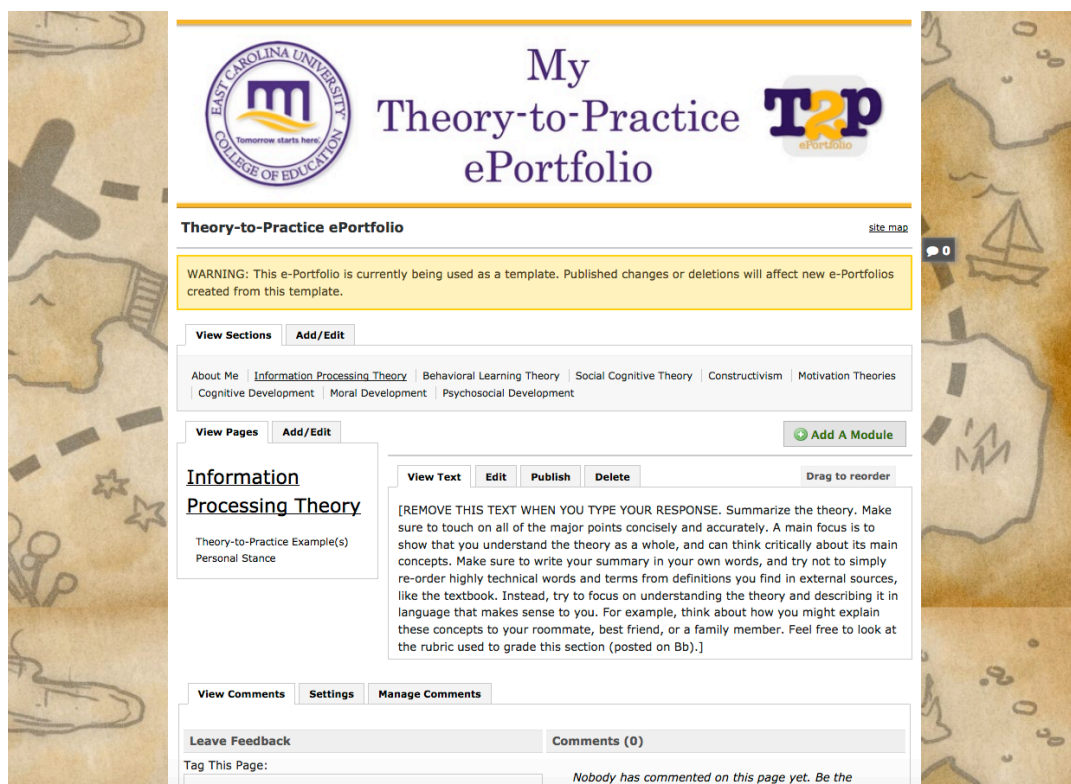


Part II:

Directions: Using the template below, develop a chart to describe and reflect on each of the theories and concepts discussed in class.

Theory/Concept	Central Focus: Theory Summary	Practical Application	Personal Stance
	Summarize the theory. Hit all of the major points concisely and accurately. <u>Make sure to write your summary in your own words.</u>	Give a detailed example of a classroom application that illustrates the theory or concept. Be specific about what exactly you will do in the classroom. <u>Make sure to describe this using your own words.</u>	<ol style="list-style-type: none"> 1. Reflect: Do you believe this theory/concept accurately and adequately describes how people learn and/or develop? Scale: 1 (<i>not at all</i>) to 10 (<i>definitely yes</i>) 2. JUSTIFY your response by relating it to personal experience. I'm looking for your personal connection to the content. Think about your own education and life experiences, and connect the content to one or more personal experiences. Tell me how that changed your behavior, made you feel, etc. If all else fails, think about your experiences in this course.
Behavioral Learning Theory			Rating: ____ Explanation:
Social Cognitive Theory			Rating: ____ Explanation:
Constructivism			Rating: ____ Explanation:
Information Processing Theory			Rating: ____ Explanation:
Complex Cognitive Processes			Rating: ____ Explanation:
Motivation			Rating: ____ Explanation:
Cognitive Development			Rating: ____ Explanation:
Psychosocial Development			Rating: ____ Explanation:
Moral Development			Rating: ____ Explanation:

Revised Assignment Template (on Digication): T2P ePortfolio



Note. The theory summary tab for one theory is showing in the above image.

Prompts Posted on Blackboard and in the ePortfolio Template:

Summary prompt: Summarize the theory. Make sure to touch on all of the major points concisely and accurately. A main focus is to show that you understand the theory as a whole and can think critically about its main concepts. Make sure to write your summary in your own words and try not to simply re-order highly technical words and terms from definitions you find in external sources, like the textbook. Instead, try to focus on understanding the theory and describing it in language that makes sense to *you*. For example, think about how you might explain these concepts to your roommate, best friend, or a family member.

Teaching example prompt: Give a detailed example of a classroom application that illustrates this theory. Use your experiences in the linked practicum course to provide at least one example, and please be as specific as possible when describing the circumstances. You can use an example found in your own teaching, something you observed during the practicum, or write about an idea you formed when reflecting on your classroom-based experiences this semester (e.g., something you think you should have done or plan to do in the future). The key is to show that you understand the theory and can apply it to what you observe or do in a real classroom. In addition to at least one example of this theory based on your experiences in the practicum course, you can add any additional connections to teaching that you find in other sources, like memes, articles, pictures, or personal educational experiences. Make sure that you write everything in your own words.

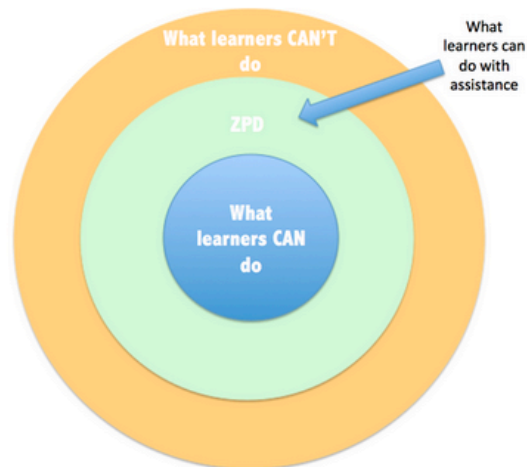
Personal stance prompt: This section includes your personal stance about the theory/concept. When reflecting in this section, consider questions like the following: Do you believe this theory/concept accurately and adequately describes how people learn and/or develop? Please JUSTIFY your response by relating it to personal experience. In other words, this is your personal connection to the content. Think about your own education and life experiences as well as your experiences during the practicum course, other courses, and other practicums.

Appendix B

Example Personalization in T2P ePortfolios

Theory Summary: Example of adding personalized graphic organizers and images

Lev Vygotsky's ideas on Cognitive Development focuses on how our thoughts can be influenced by cultural norms but mainly by interactions with other people. The Zone of Proximal Development, ZPD, is the stage of learning how to do something with assistance. The ZPD is in a three-ringed diagram that breaks down and moves inward by what children cannot do on their own, ZPD, and what they can do on their own.



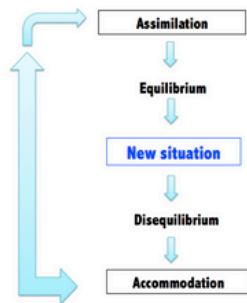
The person helping the child in the ZPD is usually a teacher or a more knowledgeable person. A person who is considered more knowledgeable is simply someone who is smarter than the child. In the ZPD while the child is learning with help, the person assisting the child benefits the learning as well, this is called reciprocity.

Teacher Implications

- Help the students answer difficult questions by scaffolding:
 - Giving the students hints or asking them leading questions
 - This helps them solve problems that they would not have been able to solve on their own

Theory Summary: Example of adding personalized graphic organizers

new information being learned without creating the misconception or confusion it is called equilibrium.



Equilibrium reminds me of a seesaw. On one side the seesaw has what the child has previously learned and whatever lands on the other side must become even with the previous knowledge. Disequilibrium is when someone creates a misconception or false idea about something new they see with their previous knowledge. This is when the seesaw that holds what the child previously learned on one side is uneven with the new knowledge trying to form.

For example, when a child studies an entirely different object and then later sees a different but similar object but believes it is still the first object based off of the

similarities. Assimilation is connecting new situations with old experiences that can create misconceptions or confusion. For example, when a person sees an object they have never seen before but have seen objects similar, they begin to think about the things they know about the objects that are similar to the new object. Making those connections from the old knowledge to something new is an example of assimilation. Accommodation is when old knowledge does not work and needs to be changed or corrected in order to learn. Referring back to the example above, after making the connections between the new object with the old object, the person learns about the aspects that were different than the old object compared to the new object, which is called accommodation.

Teacher-centered vs. Learner-centered

Teacher-centered

- Taught from *teacher to student*
- Passively teaching information
- Role: To give information and evaluate students
- The actual TEACHING & ASSESSING are done at different times
 - Assessments monitor the learning
- Always “right answers”
- Only the students are viewed as the learners

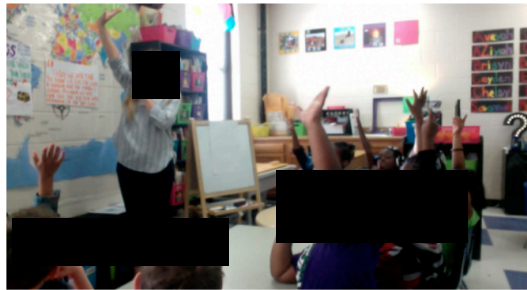
Learner-centered

- Students use skills like problem solving, talking with one another, and critical thinking to learn
- Actively involved
- The teacher is more seen as a guide or coach that assists the student
- TEACHING & ASSESSING are done together
 - Assessments promote and diagnose the students’ learning
- Learning from their errors
- Students AND teachers both learn

In the classroom, the teacher should provide many different implications for the students. The teacher can allow the students learn through discovery. problem solving.

Teaching Example: Screen shot from a teaching video

On my first day of teaching, I attempted to use vicarious reinforcement with my students, and examined how well they responded. On the first day we explained our group rule, which was, the student's must always raise their hand when answering questions. Because the students are in kindergarten, at times, they each needed an extra reminder of the importance of raising their hands. Instead of stopping the lesson and steering away from the material, I used vicarious reinforcement by complimenting one student on how well she raised her hands, I stated, "Thank you [REDACTED] for raising your hand, here is a ticket." Afterwards, every student's hand immediately shot up. The students strived for that same gratification that I gave [REDACTED]. Overall, including vicarious reinforcement increased student's positive behavior, which made each lesson run more smoothly. This has been one of the most valuable tools I have used to influence positive behavior.



I love this picture from my video. To me, it shows how engaged the students are and how great their behavior is.

Teaching Philosophy: Example of social interaction in students' statements of teaching philosophy

finds out what interest their students. When learning is centered on student's interest, it strikes their curiosity and they want to find out more. Having student's curios all year keeps the learning interesting and the classroom fun. Finally when teachers show they care about their students, they feel at home and comfortable about being themselves. The MUSIC model is a very useful tool for teachers to use. To me, I feel like the model is something every teacher should use and it should be used every single year.

In my opinion, constructivist teaching works alongside with the MUSIC model. In a constructivist classroom, it is student-led. Rather than a teacher lecturing, the students learn hands on. Having students complete projects, discussions, and answer questions are a few examples of constructivist teaching. I believe when students are in control of their own learning, they learn more efficiently. In my own classroom, I try to have a constructivist setup. I never want my students to feel bored and not challenged. I also believe in a constructivist classroom, students feel like they can get so much accomplished. Also, I believe in a constructivist classroom those misconceptions students have get noticed and solved. When my students have misconceptions, I find ways to bring them back to a state of equilibrium. I know at a state of disequilibrium, students feel lost and confused. Until students are brought back to that equilibrium state, they will feel unsuccessful in the classroom.

In my classroom, I use sources of motivation and authority. I want my students to feel comfortable with me and see that I'm a fun teacher. I want my students to also know that if they get out of line or need structure, I'll be there to give it to them. I like for my students to see their rewards I give them. When students receive awards for their great work, they are motivated to continuously do good things. I've always liked to make my lesson enjoyable for my students. Rather it be favorite things or familiar TV shows, I always like to think from the point of view of my students. As I plan my lessons, I take the time to think of how to structure my lessons to fit around my students. Going into the start of my lesson, I find a way to grab their attention. Once their attention is grabbed, I make sure I keep it by having them constantly involved in the lesson. I've also found that when my students get off topic or out of hand, reeling them back in without putting complete focus on them, helps them to get back focused.

I believe teaching this way is great way for my students to learn. I found my student enjoyed having me around and learning. I also saw my students grow from not knowina much to knowina so manv things. Thinkina mv students wouldn't remember

Thinking my students wouldn't remember what they learned from day one on the...

This is visible on the published page.

Type your comment here...

Close Send

Dec 12, 2016

I thought the same thing and at the end of the semester when I saw our student's results I was so happy and I realized how rewarding teaching really is.

Highly Structured ePortfolio Platform for Bachelor of Nursing Students: Lessons Learned in Implementation

Emma Collins and Ray O'Brien
Otago Polytechnic

In 2015, the School of Nursing at Otago Polytechnic, a tertiary institution in Dunedin, New Zealand commenced using an ePortfolio platform with students in the Bachelor of Nursing program. A project was undertaken to evaluate the implementation of this technology and determine its ongoing use. This sequential, exploratory, mixed-methods research consisted of surveys and focus groups with relevant faculty and students, using the Technology Acceptance Model. The results showed that there was support for the ongoing use of the platform. Specific recommendations were made to increase the acceptance of the platform.

Existing research justifies using ePortfolios rather than paper based portfolios in undergraduate nursing education, both nationally and internationally (Andrews & Cole, 2015; Birks, Hartin, Woods, Emmanuel, & Hitchins, 2016; Garrett, MacPhee, & Jackson, 2012; Green, Wyllie, & Jackson, 2014). The implementation of this shift from paper to electronic portfolios has not yet been evaluated in the undergraduate nursing context in New Zealand. This evaluative process is important, as poor implementation may be detrimental to learning and reduce the likelihood of continued use of a professional nursing portfolio (Birks et al., 2016). When a platform is implemented well, it can lead to enhanced knowledge and skills for its users (Posey et al., 2015). Appropriate implementation is therefore significant to educators who are implementing ePortfolios, nursing students, the regulatory bodies who ensure that nurses are competent to practice, and potential employers. This study addresses the research gap by evaluating the implementation of ePortfolios in an undergraduate nursing program in New Zealand.

This article initially explores the existing research. The mixed-method research design will then be described. The results and discussion that follow evaluate the implementation of the ePortfolio based on the Technology Acceptance Model (Andrews & Cole, 2015; Davis, Bagozzi & Warshaw, 1989; Shroff, Deneen, & Ng, 2011). The conclusion describes the overall level of acceptance and informs future implementations.

Literature Review

ePortfolios are well documented in international literature and have been a feature of higher education for many years (Andrews & Cole, 2015; Birks et al., 2016; Garrett et al., 2012; Green et al., 2014). Portfolios in general have long been used in nursing and nursing education (Birks et al., 2016; Green et al., 2014), and there has been some discussion in the literature regarding the implementation of ePortfolios within this

discipline (Birks et al., 2016; Garrett et al., 2012; Karsten, 2012). The Nursing Council of New Zealand (NCNZ) requires nurses to demonstrate competence in their practice, as evidenced through a portfolio of practice (NCNZ, 2016). In the nursing context, a portfolio is “an organised collection of professional work that follows the trajectory of a nurses' [sic] career that should illustrate the background, skills and expertise of the individual” (Green et al., 2014, p. 1). Therefore, practicing nurses are required to have skills in developing and maintaining a portfolio. This is relevant to undergraduate nursing students, as they are required to develop one or many portfolios as evidence of their emerging practice. A study by Collins and Crawley (2016), however, found that while 15 of the 16 nursing schools in New Zealand were using a portfolio, only two of these schools were using an ePortfolio.

Garrett et al. (2012) cited the elimination of physical size restrictions as one of the benefits of completing a nursing portfolio electronically. In many undergraduate nursing courses, such as the one involved with this research study, a paper “learning” portfolio has traditionally been completed for each clinical placement. This paper portfolio was more often than not produced in an A4 ring binder folder, including numerous sheets of paper and organized according to course requirements.

When examining international ePortfolio literature specifically related to undergraduate nursing courses, there appears to be a varying amount of success. Two studies reported the use of their own, internally created ePortfolio platform (Garrett et al., 2012; Karsten, 2012), while the other used a commercially purchased platform (Birks et al., 2016). All of these authors mentioned implementation difficulties. Birks et al. (2016) stated that difficulties arose in relation to technology, expertise, and faculty attitudes. Garrett et al. (2012) cited access to a computer and networks as a barrier to achieving success. All of the studies however, cited a number of advantages. Garrett et al. (2012) listed benefits including increased security, data storage/backup advantages, the ability to add digital data

and multimedia artifacts, the ability to include hyperlinks, and enhanced interaction and feedback with instructors. Birks et al. (2016) also stated that ePortfolios allow the user to develop a variety of information, as well as potentially to generate career opportunities. Karsten (2012) cited McCready (2006), in stating that

the ePortfolio provides the student with a vehicle that can present a compilation of their work, provide an opportunity for reflection, and demonstrate clinical competence that provides a link between the knowledge students gain in the classroom with the knowledge students gain from the clinical experience. (p. 23)

This is certainly an intended goal for the introduction of ePortfolios within the institution involved in this study.

Garrett et al. (2012) stated a valid point when they said that developing and using an ePortfolio should not shift the focus from the learning that the student is engaging with to the piece of technology that they are using. This should be considered by all users of an ePortfolio platform. Birks et al. (2016) provided further caution by highlighting that there was limited evidence to confirm their effectiveness. Therefore, this current study has been developed to provide evidence of the effectiveness of introducing ePortfolios into the undergraduate nursing program. The platform in this case was Pathbrite (www.pathbrite.com).

Consideration also had to be given to how the platform was to be implemented, and there is some advice in the literature for those embarking on such a project. Wassef, Riza, Maciag, Worden, and Delaney (2012) discussed implementing an ePortfolio in a graduate nursing program. These authors stated that the two obstacles with which they were faced were the initial time investment and changing the mind-set of the students and faculty about using ePortfolios. Andrews and Cole (2015) also commented that implementation of an ePortfolio platform is time-consuming. Institutional support is also invaluable to the implementation of an ePortfolio, the importance of which is evidenced in the literature (Slade, Murfin, & Readman, 2013; Luera, Brunvand, & Marra, 2016; Andrews & Cole, 2015). All of these challenges to implementation of this new piece of technology needed to be considered.

Method

Institutional Context

In 2014, faculty from the School of Nursing explored the possibility of introducing ePortfolios

into the Bachelor of Nursing program. This commenced with exploring the literature and surveying other nursing schools in New Zealand (Collins & Crawley, 2016). Once this process was complete, a lecturer who championed this initiative (EC) approached the Otago Polytechnics online learning team. Faculty from the School of Nursing, working in partnership with the Online learning team, explored a number of ePortfolio platform options. A comparison matrix guided the OP Online team in selecting an eportfolio platform, which met the required criteria within a reasonable budget and with limited commitment, to allow a six-month trial. Pathbrite was chosen as the preferred platform, and faculty training soon commenced. The "courses" version of the Pathbrite platform was introduced into year-one and year-two of the Bachelor of Nursing program in 2015.

One researcher managed the in-school nursing specific aspects of the pilot, the construction of templates, education of staff and students, and any problem solving that was needed. Another researcher managed the integration of Pathbrite into Moodle, problem solving and sharing information with other members of the online education team and IT staff so that staff and students would be supported. Direct assistance was also given from staff at Pathbrite, including training and problem solving.

Sample and Participant Selection

Ethics approval was granted in 2015 by the Otago Polytechnic Ethics Committee. Convenience sampling was used, and students were recruited into the study through an e-mail invitation to participate in the survey and subsequent focus group. A notification was also posted on the learning management system. Seventy-two students and 15 faculty chose to complete the survey. Seven students and five faculty chose to participate in the focus groups. The surveys were accessed via links to Qualtrics surveys.

Research Design

A mixed-methods sequential explanatory design was used in this study (Ivankova, Creswell & Stick, 2006). This approach was chosen to maximize the data that could be gleaned from a relatively small sample size. The quantitative data were gathered first from a survey of students and a similar survey of faculty. After the surveys were completed, focus groups were conducted, in which questions that had emerged from the survey results were posed to the participants. A model developed by Ivankova et al. (2006) was used to produce a visual representation of

Table 1
Visual Model for the Current Research Design

Phase	Procedure	Product
Quantitative data collection	Survey based on TAM distributed electronically to all 1st and 2nd year Bachelor of Nursing students and faculty in 2015, using Qualtrics; $n = 72$ (students), $n = 15$ (faculty)	Numeric data
Quantitative data analysis	Data reviewed using SPSS software	Statistics
Connecting Quantitative and qualitative phases	Refinement and development of focus group questions	Focus group outline
Qualitative data Collection	Focus groups with students ($n = 7$) and faculty ($n = 5$)	Text data
Qualitative data analysis	Thematic analysis using TAM	Cross thematic matrix
Integration of the qualitative and quantitative results	Interpretation and triangulation of the results using the technology acceptance model as framework	Discussion, Implications and Future direction

this study (Table 1), using the mixed-methods sequential explanatory design.

The survey and focus group questions were based upon the Technology Acceptance Model (TAM). The TAM (Davis, Bagozzi & Warshaw, 1989) seeks to understand mitigating factors when introducing a new piece of technology. It has been stated that the success of a system can be determined by user acceptance of the system, measured by these three factors: perceived usefulness, perceived ease of use, and attitudes towards usage of the system (Shroff et al., 2011). Andrews and Cole (2015) considered the TAM in their study, which had also looked at ePortfolios in undergraduate nursing education. Their study highlighted the importance of planning, implementation, review, and evaluation when introducing a new piece of technology. Posey et al. (2015) stated that successful implementation of a new piece of technology, such as an ePortfolio, depends on acceptance and adoption by the end user. The use of the technology acceptance model is helpful in determining that acceptance.

Quantitative Data Collection

Both student and faculty surveys were developed based on survey tools used in previous research that had utilized the TAM whose reliability had been demonstrated (Andrews & Cole, 2015; Shroff et al., 2011). Cronbach's Alpha was used to determine the internal validity of each factor in the student survey tool (Gliem & Gliem, 2003). All alpha values indicated acceptable internal validity ($\alpha > 0.7$). However, given the much smaller sample size of the faculty survey tool ($n = 15$), the researchers did not see Cronbach's alpha as a significant measure. The faculty survey tool was

seen as acceptable based on its close relationship to established tools, its similarity to the structure of the student survey tool, and the fact that it was triangulated with qualitative data at a later stage.

The data for each of the categories of the TAM are presented in Appendix A for students and in Appendix B for faculty. The extent to which Pathbrite was seen as acceptable was used as a measure of whether the implementation of the ePortfolio platform was effective. The mean was used as a measure of the acceptability at a factor level. As a score of three is the midpoint on the Likert scale used, a mean of greater than three, but less than four, indicated a general agreement that Pathbrite was acceptable. A mean of four or higher was considered an indicator of Pathbrite being highly acceptable. When analyzing the individual items in the survey, the mode and the standard deviation provided more useful information about the extent to which Pathbrite was accepted. This was further informed by the integration of the qualitative data.

Qualitative Data Collection

The student focus group had seven participants, and there were five participants in the faculty focus group. The invitation to join the student focus group was sent by e-mail, as well as via the learning management system. Faculty were e-mailed an invitation.

As per the sequential explanatory research design, there was an initial set of questions to ask at the focus groups, which were modified and enhanced by integrating the outcomes of an initial analysis of the survey data. The focus group discussions were recorded and then transcribed.

The surveys included several open response questions that did not lend themselves to quantitative data analysis.

The text generated by these questions was added to the qualitative data analysis. The transcript and survey text were then analyzed with conventional content analysis (Schneider, Whitehead, LoBiondo-Wood, & Haber, 2016), using Nvivo analysis software. This was seen as an appropriate method because it allowed the factors of the TAM to be used as initial themes (usefulness of the ePortfolio platform, perceived ease of use, attitudes and behavioral intentions toward the Pathbrite ePortfolio platform), while allowing other themes to emerge.

Integration of Qualitative and Quantitative Results

The analysis of the quantitative data from the survey was kept separate from the analysis of the qualitative data gathered from the focus group transcripts and the open-ended responses from the survey. The results from both qualitative and quantitative analysis were then integrated around the factors of the Technology Acceptance Model (TAM), to show the extent to which the ePortfolio platform was accepted by the students and faculty. The student data and the faculty data were analyzed and presented separately.

Results

The survey and focus group data were integrated in two strands: student results and faculty results. This allowed the two main perspectives to be understood prior to discussion of the implications of the results. This section presents the results of that integration.

Student Results

Perceived usefulness of ePortfolio platform.

Several survey and focus group questions concentrated on the perceived level of usefulness of the ePortfolio platform. Perceived usefulness can be described as "the extent to which a person believes that using a system will enhance their performance" (Davis, Bagozzi, & Warshaw, 1989, p. 985). The data relevant to perceived usefulness still indicated that Pathbrite was accepted as being useful ($M = 3.44$). Key themes that emerged were improved learning, increased security/privacy, reduced cost, and the ability to share with future employers. Two themes that suggest that Pathbrite was less useful were also identified: missing a hard copy and low quality feedback. The results supporting each of these themes are described in turn.

Improved learning. 42% of students who had completed a paper portfolio in the past indicated that an ePortfolio supported their learning better than a paper-based portfolio (37% neither agreed nor disagreed). This improved support of learning was identifiable in four specific themes that emerged from the qualitative data: improved reflective learning, more and better

feedback, ability to monitor own progress, and increased IT literacy.

An increased level of reflective learning was apparent in the survey responses (45.2% agreed or strongly agreed). In particular, as one student noted, the ePortfolio was seen to "increase the understanding [I] gained from [my] placements." One student articulated the benefits for their reflective practice very clearly:

It encouraged you to reflect on your experience and look at it from a different point of view. It made me more aware of the competencies and encouraged me to think how these relate to practice. It taught me a lot of new skills like taking a health history, ecomap, genogram and also allowed you to use the models which are spoken about in 505, e.g., Pender & Ottawa Charter, which helped me to understand them more and how you relate them to your practise.

The majority of students (52.7% agreed or strongly agreed) felt that the feedback they received was what they needed in order to improve their practice (28% neither agreed nor disagreed). They also identified the ability to upload work and get formative feedback prior to summative assessment and the ability to upload work for faculty to view before a meeting. Features available in Pathbrite, such as "highlighting, speech bubbles, and annotations," were seen as important in delivering feedback. One student summed this up by identifying that "lecturers were able to access my work easily and comment without us having to meet up, so if there was a problem with my work it was easy to fix before summative [assessment]." The learning was also seen to support what was expected of graduates as professional nurses in terms of competencies (66% agreed or strongly agreed) and maintenance of registration (52% agreed or strongly agreed).

The ability to monitor one's own progress as each set of submissions was uploaded was identified as motivating and reassuring, as students liked "knowing when I've done what I need to do."

Students described the need to become more IT literate as a nursing professional in a "digital age," as a specific learning outcome that the ePortfolio platform supported.

Increased security. As the content of many of the ePortfolios was of a sensitive medical or professional nature, the ability to maintain security of the ePortfolio was identified as useful in the focus group. One student described the security risk of leaving a paper copy lying around or losing it. Another described their laptop failing and the security provided by a cloud-based portfolio as being reassuring.

Reduced cost. Several students in both the survey and the focus group referred to savings due to reduced printing costs as a useful feature for them. Some added

that the ePortfolio was also a more sustainable option due to the reduced use of paper.

The ability to share with future employers. Being able to share learning and experience through the ePortfolio was identified as useful in the student focus group. This was seen as relevant in the context of New Zealand district health boards and international employers.

Missing a hard copy. Students identified a preference to have a hard copy of their portfolio. The reasons for this were described as “a hard copy adds value to your work-but online it is just sitting there and means nothing,” and that an online ePortfolio has “less sense of accomplishment.”

Low quality feedback. While the mean response to the question about feedback indicated that the level of feedback was acceptable ($M = 3.35$), there was a large number of students who neither agreed nor disagreed (27%). Several students also referred to concerns about the quality of the feedback in both the survey and the focus group. Concerns included that “lecturers did not comment on the work uploaded so you did not know if it had been read or approved,” that students did not receive any feedback, that they did not get notifications about feedback, and that the feedback received was not specific enough. A specific issue raised was that the use of Pathbrite's feedback functions was inconsistent between lecturers. One student described the frustration this caused as follows:

Not all of the lecturers used it consistently through different courses and this made it confusing; some commented through the weeks, and I could change the work according to the feedback. Some didn't, so I was unaware if I was on the right track.

The integration of the survey and focus group data suggests that the students found the usefulness of the ePortfolio platform acceptable in the areas of improved quality of learning, reduced costs, increased security, and the ability to share the ePortfolio with future employers. However, weaknesses were recognized in the quality of online feedback and some students' desire for an annotated hard copy.

Perceived ease of use. Perceived ease of use can be described as the “extent to which a person believes that using a particular system would be free from effort” (Venkatesh, 2000, p. 344). The survey questions focusing on the ease of use of Pathbrite indicated that students found the ease of use of the platform acceptable ($M = 3.38$). Five themes emerged that described the extent to which Pathbrite was seen as easy to use: user experience design, feedback functions, management of workflow, training and support, and reliability. Each of these is addressed in turn.

User experience design. During the focus group, the students used positive language about the ease of

use, such as “easy to use,” “enjoyable,” and “pretty straightforward.” A total of 58% of students agreed or strongly agreed that it was easy to use. Specifically, they said that the ePortfolio was completed more quickly than a paper portfolio, that it was simple to arrange and achieve a good presentation standard, easy to upload evidence, and easy to find things because they were all in one place. However, several students commented that it was difficult to navigate when viewing Pathbrite through Moodle, or when they encountered windows within windows. Pathbrite runs best in Google Chrome. This created issues for some students who were used to using other browsers.

Feedback functions. Students appreciated that it was “easy for tutors to access and assess” their work. Some described it as being easy to replace their work based on feedback, and others described it as a difficult task. This split of opinion was also reflected in the survey, where 54% disagreed or strongly disagreed that it took a long time to learn how to use Pathbrite for assessments. In the survey and the focus groups, students repeatedly referred to problems with notifications. The source of these problems was either that the important notifications about feedback were lost among the numerous irrelevant notifications or that there were no relevant notifications. During the focus group, several students indicated that they were not aware of the notifications feature at all.

Management of workflow. Pathbrite was seen to support students in managing their work. One student explained that “it was an easy way to keep track of my work . . . like having a checklist of things to do.” Time was seen as easier to manage, as there was no need to come to campus to hand in a hard copy. The flexibility of choosing location and time to access the portfolio was described as making the process much easier.

Training and support. While the survey data indicated that it did not take a long time to learn how to use Pathbrite, several students described initial difficulties in using it. For example, one student described a “total lack of prior instruction, which led to frustration at having to learn how to use a system prior to providing evidence of learning.” Others referred to it taking “extra time” and being “hard to learn” to use Pathbrite.

Despite these negative comments, the survey data indicated that students had accessed a variety of sources of support. In order of the number of students who had used each source of support, they were: lecturers (50 students), peers (49 students), online Pathbrite resources (nine students), Pathbrite online support desk (three students), and Otago Polytechnic IT support desk (three students). A total of 57% of students agreed or strongly agreed that they had enough support to use Pathbrite effectively, while only 16% felt that they did not have enough support.

Reliability. The reliability of being able to upload or access Pathbrite was described as affecting adversely the ease with which it could be used. Two issues were described: long or unsuccessful uploads and system crashes. Students indicated that in some cases, "it took up to 30 minutes to upload" evidence, and they were "never sure whether it was going to be working or not."

Attitudes toward the ePortfolio platform. Attitude can be described as being disposed to respond in a particular way. The cognitive attitudes described in this data relate to constructed thoughts or ideas that influence responses in line with Teo (2009).

Overall, students felt positively towards Pathbrite. From the survey items measuring attitude towards Pathbrite, there was a mean score of 3.44, which indicates that they saw it as acceptable. This positive cognitive attitude was composed of many constructed thoughts around Pathbrite. A total of 61% of students disagreed or strongly disagreed that it just created extra work and did not help learning, and 64% of students felt positive about using it again. Factors that contributed to this positive attitude included: accessibility and convenience, sustainability, the ability for lecturers to view work before meeting with students, and the ease of viewing work gathered in one location. Factors that detracted from the positivity included: technical problems, difficulty of use, and difficulty in seeing feedback. In closing the student focus group the students agreed with the general comment that they felt "generally positive, with some more training required."

Behavioral intentions towards the ePortfolio platform. Where cognitive attitude refers to specific beliefs, behavioral intention relates to conscious plans to act in a certain way. The survey items measuring behavioral intention indicated that the students intended to continue using Pathbrite ($M = 3.44$). 60% of students were considering using Pathbrite to share their work with potential future employers. A total of 51% of students intended to use Pathbrite to demonstrate their ongoing competence to the Nursing Council of New Zealand.

Faculty Results

Usefulness of the ePortfolio platform. The survey data indicated that faculty found Pathbrite very useful ($M = 3.71$). From survey and focus group data four themes emerged: providing better feedback, promoting professional practice, supporting academic quality, and supporting sustainable practice. Each is described in turn.

Better feedback. A total of 80% of faculty agreed or strongly agreed that Pathbrite supported quality feedback for students, and 87% agreed or strongly agreed that Pathbrite supported timely feedback from faculty. In the open-ended survey questions and the focus groups, faculty suggested that Pathbrite not only increased the amount of formative feedback students received, but also

led to more specific feedback being delivered in context. For example, one member of faculty described the "ability to easily provide formative comments, suggestions etc. to specific areas of student text." Several members of faculty described the ability to provide feedback before a meeting as useful.

Promotion of professional practice. A total of 80% of faculty claimed that Pathbrite established a portfolio that students could use to maintain their registration with the Nursing Council of New Zealand. It was suggested that the professional presentation of learning that Pathbrite produced supported this goal. A total of 60% of faculty supported the idea that Pathbrite increased the student's understanding of the professional competencies required of registered nurses, which aligned with two external factors: that New Zealand DHBs (District Health Boards) "are going to ePortfolios for evidence" and that Nursing informatics is "the way of the future."

Supporting academic quality. Several faculty referred to the fact that because all assessments/portfolios are on one shared system, moderation of marking was easy. Faculty indicated that the marking was "transparent" and led to "better consistency."

Supporting sustainable practice. The fact that students did not need to print a hard copy for submission and that faculty did not need to print any annotated copies to deliver feedback was seen by many faculty as making the whole exercise more sustainable. This sustainability included a reduced need for students to travel, as no hard copy had to be handed in and sustainable work patterns for faculty, as the cloud-based platform allowed more flexibility as to where and when marking or feedback could be worked on.

Perceived ease of use. While the survey items measuring ease of use indicated that faculty accepted that Pathbrite was easy to use ($M = 3.44$), one question that asked whether Pathbrite was easy to use contradicted this ($M = 2.92$). Therefore, it was necessary to examine in more detail the individual items within this factor. Four themes emerged from that analysis: user experience design, training and support, workload, and reliability.

User experience design. Faculty used positive language about using Pathbrite, such as "easy to use," "easy to navigate," "user friendly," "efficient and fast," "easy to give feedback," and "easy to use from home."

Training and support. A total of 60% of faculty felt that they had enough support to use Pathbrite effectively. This support mainly came from peers. The member of the faculty coordinating the implementation was described as having "committed as huge amount of time to supporting [us]." There was only one member of the faculty that reported using the Pathbrite help desk. It was noted that the institution's own help desk faculty were not yet familiar with the platform.

Workload. Several faculty indicated that using Pathbrite to provide formative feedback had increased their workload significantly. One suggested that their work had increased by “two hours per week,” while another suggested that the time they had spent providing feedback had doubled. This was balanced by the suggestion that if they “can use things like feedback more effectively, then we are getting more value for the extra time.” A total of 67% of faculty supported the idea that Pathbrite made it more efficient to provide high quality feedback.

Reliability. Faculty referred to specific difficulties with uploading feedback, students uploading evidence, and notifications either being irrelevant or not being received. There were some faculty who felt inconvenienced by having to use Chrome, rather than their normal preferred browser, as their internet browser. There was a significant issue in that while Pathbrite can be viewed using mobile devices, the marking and feedback functions would not work on an iPad. One member of the faculty described this in context by saying, “during hospital supervisions I wanted to mark on my iPad, while observing [the student] at the hospital.” This also adversely affected part-time faculty, who were not supplied with a work laptop, as the full time faculty were.

Attitudes to the ePortfolio platform. Faculty presented positive attitudes towards Pathbrite in both the survey and focus group. They described “enjoying” it and affirmed that “it’s a really good system” and that the “impression . . . has been overall positive.” The survey items in this factor also consistently supported this ($M = 3.71$, $SD = 0.45$). The positive attitude was supported by the fact that Pathbrite was seen as sustainable, as supporting moderation, and as allowing faculty to view students’ work before meeting them.

Behavioral intentions toward the ePortfolio platform. On the survey, 80% of faculty felt positively about using Pathbrite again, 73% of faculty would choose to use Pathbrite for assessments in the future, and 60% of faculty supported extending the use of Pathbrite. This intention to continue the use of Pathbrite was strongly supported in the focus group, where faculty described it as “the way of the future,” said that “it would be sad to go back [to paper portfolios],” and declared, “no going back, we need to move forwards.” One member of faculty noted that they preferred paper portfolios because they “liked the smell of paper . . . and actually handing something physical in.”

Discussion

The results above describe the extent to which, from the perspectives of students and faculty, Pathbrite was seen as an acceptable solution. There were significant similarities in the two perspectives, and

distinct differences. This section discusses the implications of these similarities and differences and suggests recommendations to increase the extent to which students and faculty see Pathbrite as acceptable.

Both faculty and students perceived Pathbrite as useful. There was agreement that the use of Pathbrite improved learning through increased reflection, better feedback, more timely feedback, and the ability to support academic quality through moderation of assessment. Faculty and students saw that Pathbrite would have a positive impact on future professional practice and be useful for sharing with employers. Students valued the increased level of security compared to a paper portfolio. Faculty emphasised the increased sustainability of ePortfolio compared to paper based portfolios, while students valued the reduced cost. Several students expressed concerns about the quality of the feedback they had received. This implies a lack of consistency in how faculty are using the feedback features of Pathbrite. To maximize the usefulness of Pathbrite, it is suggested that faculty receive further support in the delivery of formative feedback through Pathbrite. This support could come from the institutional online learning unit, from the departmental educational technology champion, peers, or specific faculty who have shown leadership through their own competence in this area. The timing of this training should coincide with the need to deliver feedback rather than front-loaded at the start of term, when there are significant other challenges to workload.

Both faculty and students perceived Pathbrite as acceptably easy to use. There was agreement around features of the user-experience design, such as the ease of uploading evidence, accessing feedback, and using the structure to assist with managing workflow. However, there were significant concerns around difficulties in receiving notification that feedback had been given. Therefore, students were not receiving feedback in the timely fashion in which the faculty were providing it. Faculty felt that while the quality of feedback they were providing had improved, their workload had significantly increased. Both students and faculty expressed concerns about the reliability of the platform due to long upload times and system crashes. Students and faculty both expressed concerns that Pathbrite did not operate on iPads, which was the preferred device on hospital wards. These issues may have resulted in extra stress for both faculty and students. To manage these issues around ease of use, it is recommended that increased support is provided to students. For others implementing an ePortfolio platform, they should consider adequate support for users in setting up and ongoing use of the platform. The reliability issues should be monitored closely to identify whether the issue is related to the platform or to local technical infrastructure. Faculty workloads should also

be monitored to determine whether the increased workload was due to learning a new system or inefficiencies in the system, or whether the increased load was actually producing sufficient improvement to feedback to be justifiable.

Both students and faculty presented generally positive attitudes towards Pathbrite. This positivity was reduced to some extent for students, due to issues with ease of use. Faculty, however, were consistently positive, based on increased sustainability, ease of moderating marking, and the ease of viewing students work.

In alignment with the TAM, where perceived usefulness, perceived ease of use, and attitude are all positive towards a platform, so too was the behavioral intention to continue using Pathbrite (Shroff et al., 2011). Students and faculty both intended to use Pathbrite outside of their study, and they supported both the continued use of Pathbrite in future years and extended use across the program. We found that using TAM within this study was beneficial and that it gave the researchers clear direction as to what we needed to evaluate. Using TAM gave us clear evidence that the implementation of the platform was successful, and we would recommend that others use TAM to evaluate their implementation processes.

Based on the discussion above, the implementation of Pathbrite was sufficiently successful for a recommendation that the use of Pathbrite be continued and extended across the Bachelor of Nursing program. However, there are some aspects that may be useful for others to consider if intending to incorporate a similar piece of technology into teaching and learning. As discovered in the results of this study, ongoing support and resourcing was highlighted by staff and students as an aspect of the implementation process that needs to be addressed. This has also been a concern from others who have embarked on similar journeys (Andrews & Cole, 2015; Luera et al., 2016; Slade et al., 2013). The significant time investment of the staff involved in the implementation of the platform should also be managed appropriately. This was a concern in this implementation, as well as in others (Andrews & Cole, 2015; Jones, Sackett, Erdley, & Blyth, 2007; Wassef et al., 2012).

Going forward, the faculty will continue to monitor the level of support and resourcing dedicated to appropriate and meaningful use of this platform. It is also the intention that this research will inform others in undergraduate nursing practice. Highlighting our experiences for local, national, and international groups is intended. This research also provides evidence to inform the use of the Pathbrite platform, which we will continue to evaluate and further develop.

Conclusion

The question posed at the beginning of this project was to evaluate the implementation of this new piece of

technology and determine its ongoing use. This study showed that faculty and students enjoyed using Pathbrite ePortfolio system to present and assess clinical placement work and saw value in doing so. As a result of this study, the implementation of an ePortfolio platform appears to be a success, and faculty and students would like to continue using it. However, you could also deduce that there was not overwhelming support of the system, due to a number of challenges that it posed. It is now the authors' job to ensure that the ongoing use of this platform is more than agreeable to both faculty and students. This intends to be done through feedback, user education, and an ongoing, dedicated development plan.

References

- Andrews, T., & Cole, C. (2015). Two steps forward, one-step back: The intricacies of engaging with ePortfolios in nursing undergraduate education. *Nurse Education Today*, 35(4), 568-572. doi:10.1016/j.nedt.2014.12.011
- Birks, M., Hartin, P., Woods, C., Emmanuel, E., & Hitchins, M. (2016). Students' perceptions of the use of ePortfolios in nursing and midwifery education. *Nurse Education in Practice*, 18, 1-6. doi:10.1016/j.nepr.2016.03.003
- Collins, E., & Crawley, J. (2016). Introducing ePortfolios into nursing schools. *Kai Tiaki Nursing New Zealand*, 22(5), 34-35.
- Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User acceptance of computer technology: A comparison of two theoretical models. *Management Science*, 35(8), 982-1003.
- Garrett, B. M., MacPhee, M., & Jackson, C. (2012). Evaluation of an ePortfolio for the assessment of clinical competence in a baccalaureate nursing program. *Nurse Education Today*, 33, 1207-1213. doi:10.1016/j.nedt.2012.06.015
- Gliem, J. A., & Gliem, R. R. (2003). Calculating, interpreting, and reporting Cronbach's alpha reliability coefficient for Likert-type scales. *Proceedings of the Midwest Research to Practice Conference in Adult, Continuing, and Community Education, USA*, 82-88.
- Green, J., Wyllie, A., & Jackson, D. (2014). Electronic portfolios in nursing education: A review of the literature. *Nurse Education in Practice*, 14(1), 4-8. doi:10.1016/j.nepr.2013.08.011
- Ivankova, N. V., Creswell, J. W., & Stick, S. L. (2006). Using mixed-methods sequential explanatory design: From theory to practice. *Field Methods*, 18(1), 3-20. doi:10.1177/1525822X05282260
- Jones, J. M., Sackett, K., Erdley, W. S., & Blyth, J. B. (2007). Chapter 13: ePortfolios in nursing education: Not your mother's resume. *Annual Review of Nursing Education*, 5, 245-258.

- Karsten, K. (2012). Using ePortfolio to demonstrate competence in associate degree nursing students. *Teaching and Learning in Nursing, 7*(1), 23-26. doi:10.1016/j.teln.2011.09.004
- Luera, G., Brunvand, S., & Marra, T. (2016). Challenges and rewards of implementing ePortfolios through a bottom-up approach. *International Journal of ePortfolio, 6*(2), 127-137. Retrieved from <http://www.theijep.com/pdf/IJEP235.pdf>
- Nursing Council of New Zealand (NCNZ). (2016). *Approved professional development and recognition programmes*. Retrieved from <http://www.nursingcouncil.org.nz/Nurses/PDRPs>
- Posey, L., Plank, M. M., Snyder, R., Dinneen, P. L., Feuer, M., & Wiss, A. (2015). Developing a pathway for an institution wide ePortfolio program. *International Journal of ePortfolio, 5*(1), 75-92. Retrieved from <http://www.theijep.com/pdf/IJEP167.pdf>
- Schneider, Z., Whitehead, D., LoBiondo-Wood, G., & Haber, J. (2016). *Nursing and midwifery research: Methods and appraisal for evidence-based practice* (5th ed.). Chatswood, Australia: Elsevier.
- Shroff, R. H., Deneen, C. C., & Ng, E. M. W. (2011). Analysis of the technology acceptance model in examining students' behavioural intention to use an e-portfolio system. *Australasian Journal of Educational Technology, 27*(4), 600-618. Retrieved from <https://ajet.org.au/index.php/AJET/article/view/940>
- Slade, C., Murfin, K., Readman, K. (2013). Evaluating processes and platforms for potential ePortfolio use: The role of the middle agent. *International Journal of ePortfolio, 3*(2), 177-188. Retrieved from <http://www.theijep.com/pdf/IJEP114.pdf>
- Teo, T. (2009). Is there an attitude problem? Reconsidering the role of attitude in the TAM: Colloquium. *British Journal of Educational Technology, 40*(6), 1139-1141. doi:10.1111/j.1467-8535.2008.00913.x
- Venkatesh, V. (2000). Determinants of perceived ease of use: Integrating control, intrinsic motivation, and emotion into the technology acceptance model. *Information Systems Research, 11*(4), 342-365. doi:10.1287/isre.11.4.342.11872
- Wassef, M. E., Riza, L., Maciag, T., Worden, C., & Delaney, A. (2012). Implementing a competency-based electronic portfolio in a graduate nursing program. *Computers, Informatics, Nursing, 30*(5), 242-248. doi:10.1097/NXN.0b013e31824af6d4

EMMA COLLINS is a senior lecturer in the School of Nursing at Otago Polytechnic. She is a teacher of professional nursing and research and supervises students in clinical practice. Her research interests include nursing informatics, sustainability, and positive learning environments. Emma has a variety of nursing experience, predominately in paediatric nursing, in both inpatient and community settings. Her master's degree is in child and family nursing.

RAY O'BRIEN is the Acting Director of Learning and Teaching Development at Otago Polytechnic. He has worked as an educator in a range of contexts, including military leadership training, adventure tourism, business and learning in a digital age. His research and development interests center around authentic learning and learning that makes a difference. His master's degree is in e-learning, focusing on the centralization of e-learning resources development.

Acknowledgements

The authors would like to acknowledge the faculty of the School of Nursing, OP Online, and the students involved in this project.

Appendix A
Student Survey Data

Likert Scale:

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
Value	1	2	3	4	5

Student Survey of Perceived Usefulness of Pathbrite ePortfolio:

	<i>M</i>	<i>SD</i>	<i>N</i>
The ePortfolio assessment made me reflect more on what I have learned than I normally would have.	3.42	1.004	72
The feedback I received through my ePortfolio was what I needed to improve my practice.	3.35	1.037	72
The ePortfolio assessments have given me a clear understanding of the Nursing Council of New Zealand Competencies for Registered Nurses (2012).	3.72	.826	72
The ePortfolio assessments helped me understand what is required by the Nursing Council of New Zealand for maintaining my registration.	3.47	.872	72
I have completed a paper based portfolio in the past and the ePortfolio supported my learning better	3.22	1.127	54
Mean perceived usefulness	3.44	.764	73

Student Survey of Perceived Ease of Use of Pathbrite ePortfolio:

	<i>M</i>	<i>SD</i>	<i>N</i>
The ePortfolio software was easy to use.	3.31	1.185	72
It took a long time to learn how to use the ePortfolio assessment before I could do my assessment (Reverse scored).	3.36	1.066	72
I had enough support to be able to use the ePortfolio platform effectively	3.46	.934	72
Mean level of perceived ease of use	3.38	.849	72

When I needed help with the ePortfolio, the sources of help I used were:

- ISS support (3)
- Online direct to Pathbrite support (3)
- Online Pathbrite resources (9)
- My lecturers (50)
- My peers (49)
- Other:
 - I didn't need help
 - I didn't seek help from anyone or anything, I worked it out myself
 - I just figured it out myself

Student Survey of Attitude Towards Pathbrite ePortfolio:

	<i>M</i>	<i>SD</i>	<i>N</i>
Based on my experience of the ePortfolio platform this semester I feel really positive about using it again	3.64	.997	72
I think this type of assessment really increases the depth of the learning you get from your experiences	3.19	1.030	72
I think the ePortfolio just added work and didn't help me learn.	3.49	1.021	72
Mean attitude towards ePortfolio platform	3.44	.841	72
The best thing about the ePortfolio platform was (themed from open-ended responses):			
<ul style="list-style-type: none"> • Accessible and convenient (12) • Sustainable (8) • Lecturers could view work prior to meeting up with student (7) • Easy to view the work all in one place (7) • Able to reflect back on the work (4) • Easy to gain feedback from lecturers (3) • Easy to understand and follow in terms of what was required (3) 			
The worst thing about the ePortfolio platform was (themed from open-ended responses):			
<ul style="list-style-type: none"> • Technological problems such as uploading, connectivity, browser problems (11) • Difficult to use (7) • Difficult to see feedback from lecturers (7) • Difficult to view (2) • Lack of instruction and confusing (2) • Lack of consistency from lecturers (2) 			

Student Survey of Behavioural Intention Towards Pathbrite ePortfolio:

	<i>M</i>	<i>SD</i>	<i>N</i>
I intend to use a Pathbrite ePortfolio in the future to show my competence to the Nursing Council of New Zealand.	3.41	1.014	70
I would consider using a Pathbrite ePortfolio to share with a potential employer.	3.46	1.017	70
Mean level of behavioural intention	3.44	.955	70

Appendix B
Faculty Survey Data

Faculty Survey of Perceived Usefulness of Pathbrite ePortfolio:

	<i>M</i>	<i>SD</i>	<i>N</i>
The ePortfolio assessment made it easier for me to promote reflective practice among the students.	3.20	.775	15
The ePortfolio assessment does not support quality feedback for students (Reverse scored).	3.80	.676	15
The ePortfolio assessment supports the provision of timely feedback for students.	4.00	.926	15
The ePortfolio assessments were structured in a way that gave students a clear understanding of the Nursing Council Competencies for Registered Nurses (2012).	3.60	1.056	15
The ePortfolio assessments established a portfolio that the students can potentially use in the future for maintaining their registration with the Nursing Council of New Zealand.	4.00	1.000	15
The Pathbrite ePortfolio platform supports learning better than a paper-based portfolio.	3.67	.724	15
Perceived usefulness scale mean	3.71	0.589	15

Faculty Survey of Perceived Ease of Use of Pathbrite ePortfolio:

	<i>M</i>	<i>SD</i>	<i>N</i>
The ePortfolio software was easy to use.	2.93	1.207	14
It took a long time to learn how to use the ePortfolio assessment before I could mark the students work (Reverse scored).	3.29	1.139	14
I had enough support to be able to use the ePortfolio platform effectively	3.64	.929	14
The Pathbrite platform made it more efficient to provide high quality feedback to students	3.71	.914	14
The Pathbrite platform made it easier to spot students who were struggling and need extra support.	3.64	1.008	14
Mean perceived ease of use	3.44	.698	14

Most Common Source of Help With ePortfolio for Faculty:

When I needed help with the ePortfolio, the sources of help I used were:

- Institutional support service desk (1)
- Online Pathbrite resources (2)
- My peers (15)

Faculty Survey of Attitude to Pathbrite ePortfolio:

	<i>M</i>	<i>SD</i>	<i>N</i>
Based on my experience of the ePortfolio platform this semester I feel really positive about using it again	3.87	.743	15
I think this type of assessment really increases the depth of the learning students get from their experiences	3.33	.617	15
I think the ePortfolio just added work and didn't help students learn (Negatively scored).	3.93	.458	15
Mean attitude	3.71	.452	15
The best thing about the ePortfolio platform was (themed from open-ended responses):			
<ul style="list-style-type: none"> • Could view the work prior to seeing the student on clinical (4) • Able to be used for moderation purposes (3) • Sustainable and efficient (3) • Work was displayed in one location (2) • Able to give timely feedback (2) • It provided structure for the student (2) 			
The worst thing about the ePortfolio platform was (themed from open-ended responses):			
<ul style="list-style-type: none"> • Technological problems such as uploading, connectivity, browser problems (5) • Cumbersome and confusing (4) • Time consuming (3) • Difficult to view, especially on an iPad (3) • Students not using it properly (1) • Difficult for students to view feedback (1) 			

Faculty Survey of Behavioural Intentions Towards Pathbrite ePortfolio:

	<i>M</i>	<i>SD</i>	<i>N</i>
I would support extending the use of Pathbrite ePortfolio.	3.60	.737	15
I would choose to use a Pathbrite ePortfolio assessment in the future.	3.87	.640	15
I would consider using a Pathbrite ePortfolio myself to show my own professional competencies.	3.53	.915	15
Mean behavioural intention towards ePortfolio platform	3.67	.678	15
Why did faculty intend to keep using Pathbrite ePortfolio (themed from open-ended responses)?			
<ul style="list-style-type: none"> • Easy to navigate (2) • Able to view work prior to seeing the students and therefore give formative feedback (2) • It's the way of the future (2) • Convenient (2) • More professional (1) • Moderation (1) • Uniformity (1) 			

Employer Perceptions of an Engineering Student's Electronic Portfolio

Karen Weber
University of Houston

This article examines engineering employers' perspectives on an electronic portfolio for hiring purposes. Eleven employers of engineers viewed one student's electronic portfolio (ePortfolio). To learn the potential for using ePortfolios within the hiring process, hiring managers, human resources directors, and recruiters from the engineering sector were interviewed to solicit their feedback on the ePortfolio viewed. The researcher analyzed the advantages and disadvantages associated with using an ePortfolio over that of traditional candidate screening and evaluation. Those interviewed cited specific strengths of using an ePortfolio as the ability to (a) differentiate a candidate, (b) assess potential fit and future with a company, and (c) encapsulate a candidate's traditional application materials and online media within one website. The possible drawbacks raised by the participants included (a) duplication of efforts for the candidate and employer, (b) too much information presented to the employer, and (c) the tool being unsuccessfully introduced into the hiring process, particularly during the initial screening of candidates. The culmination of the project resulted in the researcher presenting essential criteria for engineering students to include when creating ePortfolios based upon the findings from this investigation.

Purpose of the Study

Institutions within higher education are under scrutiny for inadequately preparing students for the challenges of a global economy and workforce. Employers are concerned that college graduates are lacking the 21st century skills and the necessary competencies needed to be successful upon entering the workforce (Alssid, 2014; Flores, Matkin, Burbach, Quinn, & Harding, 2012; Hart Research Associates, 2013). A gap exists between the learned skills of college graduates and employers' needs (Tugend, 2013).

In addition, under- and unemployment rates for college graduates are notable since the 2001 recession (Abel, Deitz, & Su, 2014). This is a challenge that extends beyond the United States, as Liu (2013) expressed concerns for Chinese students and Malita (2009) raised the same issue regarding European graduates. As a result, students are seeking additional ways to distinguish themselves to hiring managers.

If employers desire evidence that graduates are prepared to enter the workforce, and students wish to showcase their academic and professional attributes to those with hiring authority, educators should explore how to meet these demands (Bradley, Seidman, & Painchaud, 2012). Developing career electronic portfolios, or ePortfolios, might address both of these needs. Career ePortfolios are websites that present the highlights of students' best academic and professional work and attributes through a more comprehensive medium than a traditional résumé (Bonsignore, 2013). These websites can be made available to employers and graduate admissions committees to assess students' preparedness for positions. Joyce (2014) cited that 80% of employers surveyed admitted to viewing job seekers' profiles online before deciding if they will interview them or not. Given the likelihood that students will be

searched online during the hiring process, educators should support students in making sound decisions about what they choose to share with employers on the Internet, whether via formal ePortfolios or through other online media. However, although ePortfolios could be used for students to share their best professional work online, there is little within the literature on employers' use of ePortfolios.

The primary purpose of this study was to learn how employers perceive and might utilize student ePortfolios. Although ePortfolios are gaining popularity and complement the way in which millennial students learn and communicate (Ciocco & Holtzman, 2008), it is unclear if companies are integrating this tool within their decision-making, and if they are reviewing ePortfolios, how this tool influences their judgments. Employers are seeking skilled candidates without exerting a lot of effort in the hiring process (Malita, 2009), but much is unknown if and how those with hiring responsibilities might embrace ePortfolios. Many of the studies that do discuss using ePortfolios for employability lack specifics on how employers would use the websites in their hiring process (Woodley & Sims, 2011). This study sought to uncover detailed information from hiring officials on the perceived value of using ePortfolios.

Literature Review

First introduced in the 1990s, an ePortfolio is a medium that continues to change and evolve (Lane, 2009). Electronic portfolios are an extension of hard copy portfolios, a process that combines the collection and reflection process of creating a body of work with a final product for students (Coric, Balaban, & Bubas, 2011). The complexity of the ePortfolio landscape results from the multiple ways in which the tool is

utilized both in an educational and professional setting (Hallam & Creagh, 2010). In higher education, ePortfolios are a means for students to collect, store, reflect, and present their academic, co-curricular, and professional experiences online (Barrett, 2007). When using ePortfolios, Zubizarreta (2009) added the importance of the student's process of self-examination, how this examination has been applied, and how the student's product meets the teacher's expectations. This potential for demonstrating intellectual growth and change and encouraging self-examination are core elements of the ePortfolio development process. Its flexibility is also a distinctive quality—it can be used as a classroom assignment as well as a tool for a job search—further distinguishing it from other online academic tools, such as educational video games and digital storytelling.

Kimball (2003) defined the four types of web portfolios as “working, academic, presentation, and professional” (p. 7). The working ePortfolio is the platform for students to collect and reflect on their work. This stage in the creation process is when students are developing their ideas, goals, and objectives for the site. Once this working or staging site is developed, students' ePortfolios can evolve over time into academic, professional, and/or presentation sites. According to Kimball (2003), an academic portfolio is typically tied to an educational course or program and is often used by teachers as a tool for assessment. The presentation portfolio, as Kimball (2003) defined it, is a consolidated portfolio in which only certain components of the portfolio are shared to display specific competencies or assignments, typically for a class assignment or in earning a certification. Finally, Kimball (2003) described the professional portfolio as a product used solely for professional purposes, such as a tool for seeking a job or to demonstrate proficiencies that are related to one's career. This professional portfolio, or career, presentation, showcase ePortfolio, is the type of ePortfolio that was analyzed within this study. These types of ePortfolios are intended to solicit the attention of external constituents, such as employers and graduate school admissions committees. It “is created by students to showcase their best academic work and unique attributes that may not be demonstrated on a traditional résumé or during an interview” (Bonsignore, 2013, p. 107).

Purposes of ePortfolios

Thus there is a wide range of purposes for students' ePortfolios. The sites run the gamut from being used for student learning, reflecting, and assessing educational outcomes to presenting and showcasing students' final work (Barrett, 2007). There is an abundance of studies on using portfolios and ePortfolios as effective tools for student

reflection and assessment (Barrett, 2007; Cambridge, 2010; Jafari & Kaufman, 2006; Penny Light, Chen, & Ittelson, 2012). While reflection and assessment are certainly essential components for ePortfolios in enhancing and tracking students' educational development and metacognitive understanding of their learning, the audience of students' ePortfolios is also an important aspect of the overall process. The present study focused on career ePortfolios that are created with the intent to enhance students' competitiveness when entering the workforce. There is little in the literature that addresses how employers use ePortfolios as a component of their recruitment and selection of candidates (Ward & Moser, 2008).

Career ePortfolios Within the Workforce

Perhaps the most extensive work in the field of career ePortfolios was produced by the team members of the Australian ePortfolio Project (Hallam & Creagh, 2010; Hallam et al., 2008). While examining ePortfolio practice within institutions of higher education in Australia, they studied whether an ePortfolio would be a desirable tool for employment and career development. The findings from their two studies indicated interest in using ePortfolios for learning, and also as a tool for entering the workforce and professional development (Hallam & Creagh, 2010).

It seems that when ePortfolios are made available to hiring managers, they will be reviewed (Brammer, 2007; Ward & Moser, 2008). For instance, Woodley and Sims (2011) reported that of the four students they surveyed who showed their ePortfolios to current or prospective employers, three of the four students received positive feedback. Brammer (2007) interviewed four managers, and found that they all had viewed applicants' portfolios in the past, and three of the four had factored the portfolio into their selection and hiring process. Christmann and Dahn (2006) argued that requiring an ePortfolio submission for job searches would enable companies to communicate to failed candidates where in the process they were unsuccessful, and to place candidates in positions that were an appropriate fit with their skills and interests. Ward and Moser (2008) took their study a bit further by surveying 5,310 employers on their experience with ePortfolios, receiving a 13% response rate. They found that overall, the current usage of ePortfolios by employers was low, but those interviewed expressed an interest in using this medium in their hiring process. Yu (2012) conducted a study in which 10 human resources managers from companies in Taiwan were interviewed regarding their familiarity with ePortfolios and their perceived usefulness of the tool. Six of the 10 managers had never heard of ePortfolios, but once introduced to the resource, all viewed the tool favorably (Yu, 2012).

Career ePortfolios Within Teacher Education

The majority of the research studies pertaining to career ePortfolios are within the field of teacher education. Portfolios within the teaching profession are demonstrations of educators' "personal practical knowledge" (Craig, 2002, p. 133), so are often used by job candidates when applying for teaching positions as evidence of their work with students and in the field. For instance, Strawhecker, Messersmith, and Balcom (2007) surveyed 37 principals from K-12 schools in one Midwestern state on the pros and cons of portfolio use in hiring teachers. The top four benefits listed in order of importance were the "opportunity to view actual artifacts, comprehensive look, candidate's organizational skills, and convenience" (Strawhecker et al., 2007, p. 67). Lack of time to review portfolios was named as the most significant limitation. Boody (2009) interviewed 15 higher education representatives from the Midwest Association of Colleges and Employers who were involved with student hiring in the field of education. Boody (2009) concluded that although employers were open to viewing portfolios when presented, there was not a specific process in place for viewing them.

A total of 168 school administrators and teachers were surveyed by Whitworth, Deering, Hardy, and Jones (2011) to learn how they might use ePortfolios more generally within their hiring process. Time was again cited as the significant barrier to portfolio usage within their hiring practice, and as a result, the researchers suggested student teachers develop streamlined ePortfolios that meet the specific purposes that those with hiring authority are seeking. Temple, Allan, and Temple (2003) conducted a focus group in which educators were asked to view physical education students' ePortfolios. The researchers found that ePortfolios were viewed as a desirable employment tool, particularly for candidates who have been short-listed, but the material would need to be condensed for the employer. These findings were comparable to Painter and Wetzell (2005) who conducted a similar ePortfolio study on the hiring process for teachers.

Hartwick and Mason (2014) explored how videos included within applicants' ePortfolios might be used in the hiring process. The researchers interviewed 15 school principals, and asked them to comment on student teachers' self-introduction videos that were uploaded to their ePortfolios. They found that 14 of the 15 principals interviewed stated they would use the videos within their hiring process (Hartwick & Mason, 2014). Some of Hartwick and Mason's (2014) interview questions were utilized for the present study (see Appendix).

Need for Study

In efforts to contribute further to the field, the purpose of this study was to analyze employers' perceptions of career ePortfolios. The following research question and two sub-questions were intended to elicit answers on how the use of a student's ePortfolio might affect employers' hiring processes within the field of engineering.

- Research question: What are the advantages and disadvantages of an ePortfolio over that of traditional candidate employment screening and evaluation methods?
 - Sub-question A: In what ways are ePortfolios potentially of value to employers of engineering students in the assessment of an applicant during the hiring process?
 - Sub-question B: What information do employers of engineering students find useful and expect to find in an ePortfolio?

Fowler's ePortfolio Study

The aforementioned research questions drew from Fowler's (2012) doctoral study on ePortfolios—another contribution to the field of career ePortfolios. Fowler (2012) interviewed 12 employers from the manufacturing and services sectors to investigate whether ePortfolios were advantageous to their pre-employment screening process. Fowler's (2012) study was twofold: (a) he investigated whether manufacturing and services sector employers found ePortfolios helpful to their hiring process, and (b) he developed ePortfolio templates to be utilized for individuals interested in employment within the manufacturing and nursing disciplines (Fowler, 2012). He found these representatives would utilize ePortfolios if the content and information they desired from candidates were included within the sites. The employers interviewed believed if the ePortfolios included relevant information for their hiring needs, using ePortfolios would save them time and money within their hiring processes. The study also revealed that employers felt ePortfolios provided more depth and a more accurate representation of candidates.

The present study explored some of the questions raised by Fowler (2012), but focused on an entirely separate field—the engineering employment sector. In addition, Fowler's (2012) study focused on ePortfolio usage within the pre-screening process for employment. The present study focused on the potential of using ePortfolios in all stages of the candidate screening and evaluation process.

Methodology

Participants for Study

To address the research questions raised within this qualitative study, the researcher interviewed engineers, or those with experience in hiring engineers, to garner their feedback regarding an engineering student's ePortfolio. Once IRB was obtained, the participants were selected through purposeful, criterion-based case selection sampling and snowball sampling (Patton, 2015). Eleven participants were interviewed: eight participants were career engineers with hiring experience and three were human resources professionals and specialists who recruit and hire engineers. Because this study examined the potential of using ePortfolios in all stages of the candidate employment screening and evaluation process, it was necessary to interview participants who represented each stage of the hiring process—from recruitment to the final interview of the candidate.

Many of the participants represented large oil and gas companies. Other fields represented included chemical engineering, civil engineering, computer engineering, exploration and production, and electricity and natural gas (Table 1). The age span of the participants was 34-60 years of age, and a broad spectrum of ethnicities was represented. The participants in this study were largely unaware of what ePortfolios were regarding career purposes. Only one participant in the study actually discussed past experiences using the tool. The other participants answered the interview questions based upon the *potential* of using ePortfolios for their hiring purposes.

Engineering Student's ePortfolio

Each participant in this study viewed the same engineering student's ePortfolio. This ePortfolio was chosen because it was an example of a career ePortfolio (Bonsignore, 2013), the type of ePortfolio for the present study. The student built the site with the intention of an employer or graduate admissions committee reviewing his finest academic work and distinctive professional attributes that were too robust to share within a résumé and too detailed to discuss during an interview. This engineering student's ePortfolio was also an example of a university student's ePortfolio within the field of electrical and computer engineering. Garnering feedback on this ePortfolio may be helpful to college students and administrators associated with collegiate ePortfolio programs.

The engineering student originally built the website as an undergraduate in the field of electrical and computer engineering. He enrolled in an ePortfolio

course for undergraduates, which assists students in developing their academic portfolios for graduate school and the work force. He then updated the website when he graduated with his master's degree in electrical and computer engineering. Overall, the website looked professional and included artifacts pertaining to the field of electrical and computer engineering.

The engineering student's ePortfolio for the present study included the following structure:

- “Welcome” web page: included student's academic bio, overview of the ePortfolio, professional photos, a LinkedIn profile, and contact information;
 - an “About Me” web page (included photos of the engineering student playing sports, and attending sports and music events) and a “Contact Me” page were located under the “Welcome” tab;
- “Academics” web page: included student's major and minor, grade point average, and university logo;
 - a “Curriculum” page, “Relevant Courses” page, and “Academic Projects” page were located under the “Academics” tab, which provided detailed information on the courses the student has taken and descriptions and photos of the projects he conducted within the courses;
- “Undergraduate Research” web page: included an introduction on the importance of undergraduate research to the student, a brief synopsis of the research conducted, and the faculty mentor's name and department; the student included a separate webpage for each of the three research programs he participated in, and a webpage on a national conference he presented at under this tab; two separate research posters were included within this section and photos were featured from a national conference;
- “Professional” web page: served as a landing page for three additional pages:
 - “Honors & Awards,” “Leadership,” and “Résumé,” which each included a page with a listing of awards and achievements, photos and information on leadership activities as an undergraduate, and an embedded and linked version of a PDF of his résumé;
- “Other” web page: featured professional photos of student; and
- “Sitemap” web page: included a sitemap for student's ePortfolio.

Table 1
Participant Chart for Years of Hiring Experience, Field(s), and Size of Company

Participant	Professional background	Hiring experience in years	Field(s)	Size
1	Engineer with hiring experience	9-11	Oil and gas	Large
2	Engineer with hiring experience	>15	Civil	Medium
3	Engineer with hiring experience	>15	Oil and gas, petroleum, software	Small
4	Engineer with hiring experience	9-11	Chemical, electrical, industrial, mechanical	Large
5	Engineer with hiring experience	9-11	Oil and gas, chemical	Large
6	Engineer with hiring experience	>15	Oil and gas	Large
7	Engineer with hiring experience	3-5	Oil and gas	Large
8	Engineer with hiring experience	12-14	Computer	Large
9	HR professional who hires engineers	>15	Exploration and production	Small
10	HR professional who hires engineers	>15	Electricity and natural gas	Large
11	Specialist who recruits engineers	12-14	Oil and gas, petroleum	Large

Data Collection and Analysis

The researcher conducted semi-structured interviews with the 11 employers to garner their feedback on the engineering student's ePortfolio website. In advance of the interview, the researcher emailed each participant the specific hyperlink to view the student's ePortfolio. Participants were asked to review the ePortfolio prior to the scheduled interview time. The employers were not planning to actually interview this student for a position; this review of the ePortfolio was an exercise to learn how the participants perceived the ePortfolio and might use it in their hiring of an entry-level engineer. During the actual interview, the participants were asked questions regarding the ePortfolio they previously viewed. Many of the interview questions for this study were based upon the semi-structured interview questions of Fowler (2012) and Hartwick and Mason (2014).

All of the interviews were audio-recorded, and copious observational notes were taken during the interviews. The process of coding and analyzing the interviews resulted in identifying common themes and insights derived from the participants' responses to ePortfolios. It was an active analysis of raising questions about the data, and then developing categories and concepts through systematically organizing and analyzing the data (Corbin & Strauss, 2015; Strauss & Corbin, 1990). Through triangulation, Creswell's (2003) guidelines for interpreting and analyzing data within qualitative studies were used as a means to cross reference the coding and understanding of the data. The software program Dedoose was used to record and store data, identify the codes and concepts, code the transcripts, and interpret, analyze, and depict the data.

Confirming Validity of Study

Numerous measures were taken by the researcher to confirm the validity of the study. To begin with, an engineering professor, who is also a professional engineer, reviewed the interview questions before the study commenced, and confirmed the questions were likely to solicit the information the study was designed to investigate. Next, a pilot or feasibility study was conducted to identify any potential barriers or pitfalls within the design of the research project. The director of the university's engineering career center was also consulted several times throughout the research process to validate the findings. Finally, since this was a doctoral study, the chairperson on the dissertation committee also assessed the data collection and analysis process.

Findings

Overall, the engineering student's ePortfolio was well received by the employers. Most participants saw value in the tool's potential, and would consider using the website within their hiring process. Regarding general characteristics of the ePortfolio, participants liked the ability to easily access information and navigate through the site. They also liked the portability and convenience of the ePortfolio. For example, one employer noted, "Overall, it's still a very beneficial product and I think one that is very worthwhile for the student" (Participant #4).

Strengths of Using ePortfolios

The participants expressed specific strengths of using an ePortfolio. These attributes included providing employers with the ability to (a) differentiate a candidate, (b) assess potential fit and future with a company, and (c)

encapsulate a candidate's traditional application materials and online media within one website.

Differentiate a candidate. Since the ePortfolio extends beyond the traditional résumé, it offers more information to the employer. Therefore, participants felt using an ePortfolio could change the way candidates are evaluated since it allows applicants to better differentiate themselves. For instance, if the ePortfolio is of a high caliber, it might be the deciding factor that leads to an interview. One employer indicated, "If you're putting together an ePortfolio, that sort of implies resourcefulness because you're separating yourself from the norm" (Participant #7).

The participants appreciated that the ePortfolio allowed them to learn as much as they chose to discover about the candidate. Phrases such as "dig," "go deeper," and "deep dive" were repeatedly mentioned. They could go below the surface—dig in a little more—and learn additional information about the candidate from the ePortfolio. More specifically, employers might differentiate an applicant through an ePortfolio by learning more about their well roundedness, online brand, initiative, written and oral communication skills, and professional recommendations.

Potential fit and future. Several participants shared that they are looking for the right fit for the long-term when hiring applicants. These employers were interested in a candidate's ability to grow and develop as an individual. It is often the soft skills that differentiate one applicant from another. They believed ePortfolios enable an employer to learn more about a candidate's personality and background, creativity and thought process, ability to work effectively within a team, and adaptability and ability to cross train. Most participants' favorite page within the ePortfolio was the student's About Me profile. They liked the personalized nature of the content because it could address the candidate's potential fit within the organization. This section within the website served as an invitation to get to know the engineering student. For instance, an employer shared that, "For me, the About Me section is very interesting because a lot of times we have information with the student on a résumé on one page, but then we want to get more" (Participant #5).

In addition, most of the participants rated the Academic Projects webpage as among the most impactful aspects of the ePortfolio. They appreciated seeing pictures and diagrams of the work the student had completed. This provides evidence of what students have created, how they can potentially contribute to an organization, and if they can work collaboratively. In this way, the ePortfolio can be used as evidence of students' individuality and a demonstration of their creativity and thought process.

Encapsulate application materials and online media within one website. The employers appreciated

the candidate's ability to use an ePortfolio to encapsulate traditional application materials, such as combining the résumé, cover letter, and basic biographical information with a variety of online media and profiles. Using the ePortfolio to screen digitally a candidate's skills and attributes through keyword searches and conducting electronic queries was also noted. Many participants used the phrase "one-stop shop" when referring to the ePortfolio.

In addition, most participants mentioned LinkedIn during the interview process. Participants use this professional social media site, which supports over 500 million users, as a tool for networking and learning more about a candidate. Several participants suggested that students coordinate their résumés, LinkedIn pages, and ePortfolios, so the messaging of all three media is consistent and readily available to employers.

Drawbacks of Using ePortfolios

The engineering student's ePortfolio was generally well received. Nevertheless, participants' noted consistent drawbacks to using the tool. The participants believed introducing ePortfolios could result in a (a) duplication of efforts for the candidate and employer, (b) too much information presented to the employer, and (c) the tool being unsuccessfully introduced into the hiring process, particularly during the initial screening of candidates.

Duplication of efforts for candidate and employer. Participants raised concerns regarding a duplication of efforts for the candidate and possibly the employer. Companies, especially large-sized organizations, often have stringent application processes the candidate must complete. Typically candidates applying for positions are not required to submit ePortfolios, and this could mean additional work for the recruiter as well. In addition, many employers and candidates are already using LinkedIn as a tool for screening and networking during the hiring process. One of the participants said,

I like the [ePortfolio] concept because it's a one-stop shop and it's very user friendly; you can click and see whatever you like very easily. It seems like there's a little bit of duplication with something like LinkedIn, and then also it might require the student to do extra work because every company has a different hiring process. (Participant #5)

To address these concerns, it was suggested candidates integrate their ePortfolios within their LinkedIn accounts, with the knowledge that many professional recruiters use LinkedIn rather than ePortfolios to search for talent.

Too much information presented to employers. When asked about potential drawbacks, some employers were concerned with applicants presenting

too much information. This could result in information overload for the employer. It could also introduce potential biases within the hiring process. Some participants acknowledged the tenuous balance between the professional and personal components within an ePortfolio. There was a concern of the biases that could arise by sharing personal information.

Unsuccessful introduction into hiring process.

Most participants expressed their reliance on the résumé, and its intrinsic value to the initial step of their hiring process. Employers often depend on their industry's standards of the résumé as their first step because it is typically a single page in length, and thus can be reviewed in less than two minutes. Employers in the present study could receive 100-800 résumés for one job opening. Recruiters and hiring managers must decipher quickly whether a candidate has the skills and qualifications for the open position. The majority of the participants agreed they would always begin their process with a résumé.

Probable Uses for ePortfolios

Although the participants interviewed expressed both pros and cons to using an ePortfolio as an additional tool for hiring, there was a consensus among the participants that the ePortfolio has the potential to change the way a candidate is evaluated. The prevailing viewpoint of the participants was that since the ePortfolio provides more detailed information than a traditional résumé, if done well it would likely distinguish the candidate among other applicants. The participants in the present study shared their thoughts on (a) when and how in the hiring process they might use the ePortfolio, (b) how ePortfolios might affect the timing of their hiring processes, and (c) the time they spent viewing the engineering student's ePortfolio.

When and how in the hiring process ePortfolios would be used. This exercise of reviewing ePortfolios was not a part of the participants' existing hiring practice. Some employers shared information on how they currently conduct their job searches, but others did not. However, given that the 11 employers represented different companies, the particulars of their hiring practices would likely all differ. Be that as it may, many participants mentioned that recruiters often start the hiring process by quickly reviewing résumés, narrowing the pool, and then making their recommendations to the hiring managers. The hiring managers then conduct a more comprehensive evaluation of the remaining candidates, selecting those who will be interviewed.

When the participants were asked if they would review or use the student's ePortfolio in their hiring process, they all stated they would. Overall, most employers felt the ePortfolio would make a difference in how the candidate was evaluated once the applicant

got through the initial screening process, provided the ePortfolio was done well. It was viewed as a helpful step before the actual conversation with the applicant, and some saw its value after the in-person interview as an additional resource. For example, one participant noted, "If you're down to that shortlist, I could see this being a great tool" (Participant #6). Another said, "Where this will be extremely valuable, I think, is the deep dive if I'm going to make a consideration of one or two people" (Participant #3).

The prevailing viewpoint of the participants was to use the ePortfolio before and after the interview stage. The participants were divided, however, in regard to using ePortfolios for the pre-screening process. Approximately half of the participants would use it for pre-screening, and the other half would not. Some employers felt the ePortfolio could be used in other ways, such as a reference during the interview, a resource when future positions become available, and as a tool for a supervisor to review once someone has landed an internship, or before an employee's first day of work, in efforts to build a rapport with a new hire. Some participants believed the ePortfolio would add value when hiring an intern, but others did not.

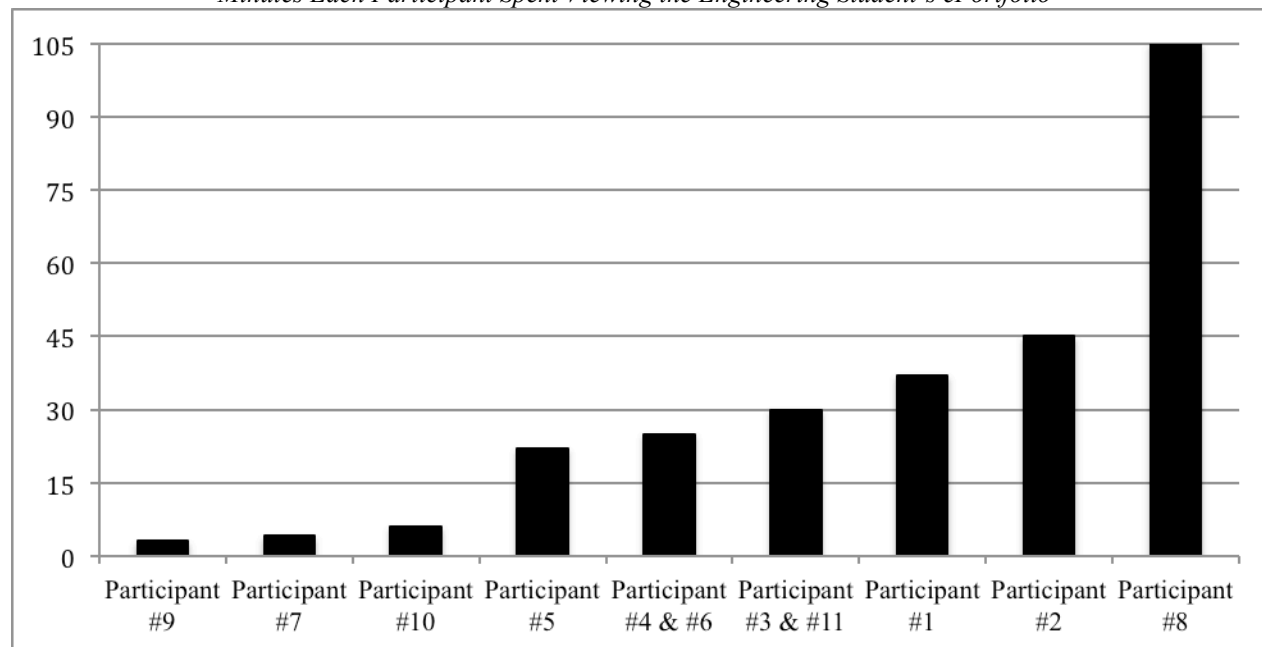
How ePortfolios affect timing within hiring process. The employers were conflicted as to whether implementing an ePortfolio into the hiring process would save time or not. Most of the participants open to using the ePortfolio in pre-screening believed the tool would need to be officially adopted by the organization and fully integrated into the company's hiring process to be effective and time efficient. Others believed the implementation would add time, but felt better decisions would be made as a result. A few participants believed utilizing ePortfolios would ultimately save time in the later stages of the hiring process, once the candidate pool is narrowed. In this scenario, the ePortfolio could be used as a resource guide instead of conducting additional screenings. One participant in the study had actually used ePortfolios in all stages of the hiring process, and felt it saved time overall.

Time spent viewing the engineering student's ePortfolio. Participants were asked how long they spent viewing the engineering student's ePortfolio. The time varied greatly among the participants; the average among the 11 participants was 30 minutes. Figure 1 depicts each participant's total time spent viewing the ePortfolio.

Recommendations for ePortfolio Design

During the interview process, the participants suggested tips and guidelines for students when creating ePortfolios. To begin with, the "less is more" sentiment was embraced by those interviewed; keep the ePortfolio clean and concise. The consensus was that if you make recruiters' life easier, they will be more apt to

Figure 1
Minutes Each Participant Spent Viewing the Engineering Student's ePortfolio



use the ePortfolio and the candidate will fare better. For instance, the Home Page should be kept simple to immediately provide pertinent information to employers, such as offering a brief bio on the candidate and making the résumé readily available. Next, students should develop an ePortfolio that takes full advantage of the online medium. Those creating ePortfolios should hyperlink information, upload video and audio files, and insert artifacts that are engaging. Students were encouraged to ask professionals from their industry to review and critique their sites before entering the job market. Asking employers to view an ePortfolio could be a way for students to build a rapport with employers, as well as to determine if their ePortfolios are appropriate.

Given the inherently personal nature of the ePortfolio, balancing professional with personal information, can prove challenging for students (Svyantek, Kajfez, & McNair, 2015). Students must find the fine line between sharing personal information and showcasing too much. To address this issue, employers suggested that if students are going to upload pictures, the photos should be professional because the images will say a lot about them. Participants also dissuaded students from linking their personal social media sites to their ePortfolios. Additional pitfalls mentioned for ePortfolio developers to avoid included web pages that are under construction or not yet developed, broken hyperlinks, and acronyms that would be unclear to an employer.

Full-length documents should not be uploaded; instead consolidate the artifact to one to two pages.

Sharing the ePortfolio With Employers

Students should provide links to their ePortfolios on their résumés. The link could be under the student's name or in a line on the bottom stating, "Visit my ePortfolio" or "This is my ePortfolio." This additional line might replace the References section, and lead people to the ePortfolio's About Me page. The ePortfolio link should be easy to access, so a short URL or web address was recommended. A quick response (QR) code directing to the ePortfolio could also be added to a résumé. A QR code is a barcode that users can scan using their smartphones, and it will direct them to a corresponding website. The ePortfolio link could be included in a cover letter, embedded on a LinkedIn page, or printed on business cards. If it is a digital cover letter, the candidate should hyperlink the ePortfolio address for ease of access.

Comparing Study's Findings with Fowler (2012) and Hartwick and Mason (2014)

The results from this study both compared and contrasted with Fowler's (2012) results. In both the present study and in Fowler's (2012) study, the employers agreed that ePortfolios provided more depth and breadth of information. In the present study,

however, the engineering employers disagreed with Fowler's (2012) participants that ePortfolios would save time and money in the hiring process. In addition, there were similarities in the findings between the Hartwick and Mason (2014) study and the present study. The ePortfolios were perceived as valuable in regards to their convenience, accessibility, and portability, and videos were well received. The majority of Hartwick and Mason's (2014) participants would use the ePortfolio prior to an interview and following an interview as compared to an initial screening tool; these were the same results as the present study. The amount of time it would take to view ePortfolios was perceived as a barrier in reviewing candidates' websites within both studies.

Essential Criteria for Engineering Students' ePortfolios

There were particular components the employers of engineers found useful, and would like to review within an engineering student's ePortfolio. While not every participant expressed an interest in each of the items, these components are representative of themes and subthemes that predominantly emerged within this study. These elements include (a) an executive summary; (b) an accessible résumé; (c) an About Me page; (d) academic and professional experiences and projects; (e) research, leadership, and service information; and (f) references. As a result, the researcher recommends the following essential criteria for an engineering student developing an ePortfolio:

- Home Page: should include an executive summary of the student, such as the student's name, major, university, contact information, additional relevant academic information, and any other professional and academic websites or social media sites;
- Résumé: should be easy to find, access and print;
- About: should include a personal bio on student that may or may not include photos;
- Academic Experience and Projects: should provide evidence of student's work in courses and scholastic work outside the classroom; might include images, presentations, diagrams, charts, and audio and video files;
- Professional Experience and Projects: should provide evidence of student's work for a company or internship; might include images, presentations, diagrams, charts, and audio and video files;
- Research: should include a description of research (if applicable for student); might include research posters, images, presentations, diagrams, charts, and audio and video files;

- Leadership: should provide evidence of leadership experiences both on and off campus (if applicable for student); might include images, presentations, diagrams, charts, and audio and video files;
- Service and/or Teamwork: should provide evidence of service and/or group experiences both on and off campus (if applicable for student); might include images, presentations, diagrams, charts, and audio and video files; and
- References: should include quotes or letters from professors and employers.

These guidelines were developed through coding and analyzing the participants' feedback within the present study. The criteria were also determined based upon the artifacts the participants mentioned wanting to view within an ePortfolio. These recommendations are also supported in part by Fowler's (2012) findings and Hartwick and Mason's (2014) findings. Also, these guidelines are in accordance with the ePortfolio pedagogy practices of Turns, Sattler, Eliot, Kilgore, and Mobrand (2012), who encourage students to create ePortfolios that are "experience-based" (p. 3) and include artifacts from their coursework and research. Figure 2 depicts an example of what an engineering student's ePortfolio might resemble if using the criteria recommended by the researcher.

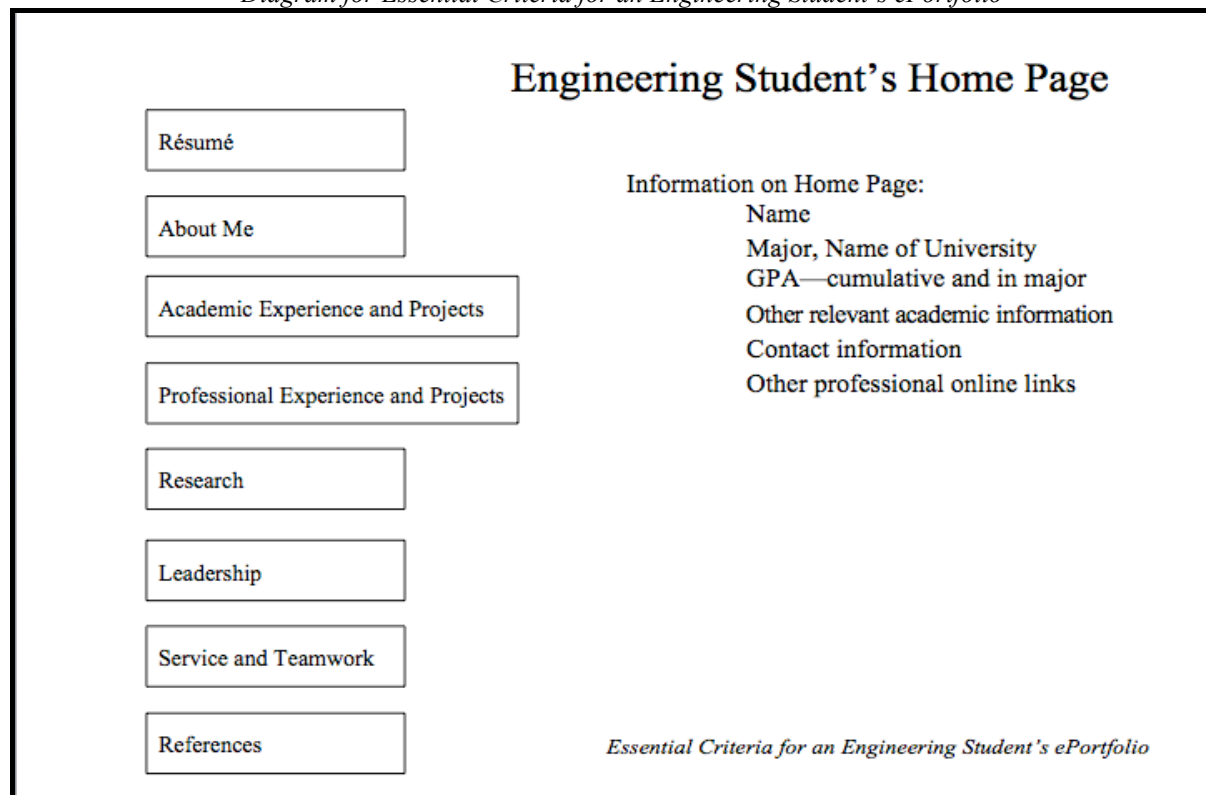
Implications of Study

There is no question that hiring trends—particularly recruiting practices—are becoming increasingly digitally driven. By way of example, LinkedIn grew from 37 million subscribers in 2009 to over 450 million subscribers in 2016 (Statista, 2016). Within the present study, the majority of the participants referenced LinkedIn in some capacity. Clearly employers rely on the Internet in their hiring practices. As a result, it is imperative that students are aware of how to best present themselves digitally when seeking employment, as well as the implications and the problems that can arise due to their online profile.

Recognizing Inherently Personal Nature of ePortfolios

Given that an overarching theme among participants was that an ePortfolio enabled them to better differentiate a candidate and helped assess potential fit and future with a company, developing a professional ePortfolio could be advantageous for students entering the job market. For instance, one participant stated, "An ePortfolio allows us a better view into a candidate than the conventional methods" (Participant #4). The participants in the present study

Figure 2
Diagram for Essential Criteria for an Engineering Student's ePortfolio



expressed an interest in learning about a student's academic and professional experiences. A standard résumé or application is typically not going to provide evidence of detailed activities, communication skills, the ability to work within a team, and the critical thinking skills that employers are seeking.

Nevertheless, an expressed disadvantage to using an ePortfolio was the increased amount of content presented to the employer. Some employers were concerned that showcasing this additional information could lead to biases and subjectivities toward the candidate that could affect the ethics of the hiring process. Therefore, the findings from this study are essentially "a double-edged sword" for students. Given the inherently personal nature of the tool, students should be aware that it does expose them to potential biases. Students should closely consider if they wish to develop an ePortfolio, and if so, what and how much they choose to share. On the other hand, it is a platform for students to share their narrative and explain perceived problems in their application materials. For instance, a student may have a lower GPA as compared to other candidates. The reason could be a challenging first year in college or life circumstances beyond their control. Due to the personal nature of an ePortfolio,

students have an opportunity to explain how changing majors, or taking time off of school and then returning, enabled them to get back on the right track.

One-Stop Shop for Employers

Another dominant theme was that the ePortfolio encapsulates a candidate's traditional application materials and online media within one website. This demonstrates how ePortfolios are viewed as qualitatively different than traditional paper portfolios. As a digital medium, they offer possibilities for easier accessibility, flexibility, and convenience. This one-stop shop for employers was valued as a potential portal for students to house their résumés, LinkedIn pages, and ePortfolios within a central location. For this reason, students should take inventory of their online media, seeking to integrate their multiple digital presences. The résumé should include a link to the LinkedIn profile and ePortfolio. LinkedIn subscribers can embed or link to their ePortfolios in the Summary section of their LinkedIn profile. For the ePortfolio, the LinkedIn account and online résumé should be easily accessible on the Home Page of the website.

Integrating multiple online profiles addresses many of the disadvantages raised by employers within the present study. A central online clearinghouse enables employers to view as much or as little as they choose about an applicant. It also allows them the leisure to use the tools whenever in the process they see fit—as a pre-screening tool; before, during, or after an interview; or once hired, as a way to get to know the candidate prior to beginning the position.

Whether the online résumé, LinkedIn page, or ePortfolio serves as the hub, all the spokes must be aligned. It is important that the messaging is consistent among platforms and that the facts remain up-to-date. Managing this information may be laborious. Doing so, however, will increase the likelihood that employers will view the information and will receive a consistent message. Given how many jobs people typically work throughout their lifetime, it is prudent for those seeking employment to emphasize the competencies and skills honed through numerous professional positions within their ePortfolios (Chen, 2009). Having a comprehensive and consistent online presence is an ideal way to showcase the broad range of talents and experiences young professionals acquire in the early stages of their careers.

Teaching Best Practices in Creating and Managing Online Presences

Providing students with an additional digital tool for employment can assist them in entering the job market. Nevertheless, students must be aware of the potential for bias by employers when sharing personal photos and information online. Teaching students about ePortfolios presents an ideal opportunity to converse on these subjectivities. Educators can engage students through in-class discussions and analyses of case studies, and then empower students by allowing them to decide how they will present themselves online. Even if an academic department decides not to offer an ePortfolio program to students, educating students on how to create and manage online presences is important. Many graduating seniors and recent college graduates will have a LinkedIn account, and even more will have other social media sites and online presences live on the web for employers potentially to access. Teaching college students about best practices on the web and recognizing the potential for bias will assist them when entering the job market.

Incorporating ePortfolios Into the Hiring Process

If incorporating an ePortfolio component into the application process, companies need to consider when and how they would like to use the medium. The participants for the present study were divided as to when they would use the ePortfolio, for what purpose,

and how it might affect the timing of their overall hiring process. The implications of these findings implore organizations to invite everyone who participates in the hiring of applicants to be involved in the decision-making process on the use of ePortfolios. All the stakeholders should invest ample time and energy when determining if ePortfolios should be adopted. If implemented into the hiring process, employers should consider which components of the ePortfolio should be required, how applicants should submit ePortfolios, and when and how in the process they should be adopted.

Limitations of the Study

There were limitations within the scope and design of this qualitative study. This was a narrow case study pertaining to the field of engineering; the observations and interviews collected were not representative of all individuals within the engineering sector. Recognizing that the engineering sector as a whole is incredibly broad and diverse, future inquiries would benefit from focusing on one particular field, such as mechanical engineering or computer engineering, as well studying similar sized companies with shared missions. Other limitations include the participants' affiliation with the university in which the study took place, the one engineering student's ePortfolio the subjects reviewed, and the employers' limited past experiences with ePortfolios. In addition, this exercise of reviewing ePortfolios was outside of their actual hiring practice. Also, the employers provided feedback on an ePortfolio for a student they were not actually considering for a position within their firms. These limitations were taken into account when analyzing the findings for the study.

Potential Future Studies

These findings have paved the way for additional inquiries in the field. Future analyses might include testing the researcher's essential criteria for students building ePortfolios. Continuing studies might also entail conducting a similar analysis on a different employment sector or with another audience, such as members of graduate admissions committees. This type of inquiry would also benefit from collaborating with researchers in the field of career services to advance the work. Finally, performing a comparative study on LinkedIn and ePortfolios would be insightful.

Conclusion

This qualitative analysis on ePortfolios was an invitation for the researcher to interact with employers by stepping outside the classroom and off campus, and connect with the greater collegiate community. It is crucial these types of inquiries continue to take place to

enhance communication and understanding among educators and employers. These avenues for inquiry help establish mutual understanding and build networks for all parties committed to improving the education and career readiness of college graduates. If students are concerned about an uncertain future upon graduation, and employers are skeptical about their preparedness for the workforce, creating opportunities to dialogue and collaborate is critical for understanding and future success.

References

- Abel, J. R., Deitz, R., & Su, Y. (2014). Are recent college graduates finding good jobs? *Current Issues in Economics and Finance*, 20(1), 1-8. Retrieved from http://www.newyorkfed.org/research/current_issues/ci20-1.pdf
- Alssid, J. L. (2014, February 27). A new Gallup survey says colleges and employers disagree about how workforce-ready graduates are—who's right? *The Huffington Post*. Retrieved from http://www.huffingtonpost.com/julian-l-alsid/a-new-gallup-survey-says_b_4862669.html
- Barrett, H. C. (2007). Researching electronic portfolios and learner engagement: The REFLECT initiative. *Journal of Adolescent & Adult Literacy*, 50(6), 436-449. doi:10.1598/JAAL.50.6.2
- Bonsignore, K. (2013). Career ePortfolios: Recognizing and promoting employable skills. In K. V. Wills & R. Rice (Eds.), *ePortfolio performance support systems: Constructing, presenting, and assessing portfolios* (pp. 107-118). Anderson, SC: Parlor Press.
- Boody, R. M. (2009). Career services perspectives on the use of portfolios in the teacher employment process: A survey. *Education*, 130(1), 67-71.
- Bradley, M. J., Seidman, R. H., & Painchaud, S. R. (2012). *Saving higher education: The integrated, competency-based three-year bachelor's degree program*. San Francisco, CA: Jossey-Bass.
- Brammer, C. (2007). Electronic portfolios: For assessment and job search. *Proceedings of the 72nd Annual Convention of the Association for Business Communication*, Washington, DC. Retrieved from <http://www.businesscommunication.org/page/2007-annual-proceedings>
- Cambridge, D. (2010). *E-portfolios for lifelong learning and assessment* (3rd ed.). San Francisco, CA: Jossey-Bass.
- Chen, H. L. (2009). Using ePortfolios to support lifelong and lifewide learning. In D. Cambridge, B. L. Cambridge & K. B. Yancey (Eds.), *Electronic portfolios 2.0: Emergent research on implementation and impact* (pp. 29-35). Sterling, VA: Stylus.
- Christmann, A., & Dahn, I. (2006). *E-portfolio benefits for the labor market: A case study*. Retrieved from <http://userpages.uni-koblenz.de/~dahn/articles/ePLabor.pdf>
- Ciocco, M. D., & Holtzman, D. (2008). Prior learning assessment: E-Portfolios and the millennial students. *Journal of Continuing Higher Education*, 56(3), 69-71. doi:10.1080/07377366.2008.10400165
- Corbin, J., & Strauss, A. (2015). *Basics of qualitative research: Techniques and procedures for developing grounded theory* (4th ed.). Thousand Oaks, CA: Sage.
- Coric, A., Balaban, I., & Bubas, G. (2011). Case studies of assessment ePortfolios. *Proceedings of the 14th International Conference on Interactive Collaborative Learning, Slovakia*, 89-94. doi:10.1109/ICL.2011.6059552
- Craig, C. J. (2002). School portfolio development: A way to access teacher knowledge. In C. Sugrue & C. Day (Eds.), *Developing teachers and teaching practice: International research perspectives* (pp. 130-145). London, UK: Routledge/Falmer.
- Creswell, J. W. (2003). *Research design: Qualitative, quantitative, and mixed method approaches*. Thousand Oaks, CA: Sage.
- Flores, K. L., Matkin, G. S., Burbach, M. E., Quinn C. E., & Harding, H. (2012). Deficient critical thinking skills among college graduates: Implications for leadership. *Educational Philosophy and Theory*, 44(2), 212-230. doi:10.1111/j.1469-5812.2010.00672.x
- Fowler, M. (2012). *Developing a template for electronic portfolios in career and technical education* (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses database. (UMI No. 3503365)
- Hallam, G., & Creagh, T. (2010). ePortfolio use by university students in Australia: A review of the Australian ePortfolio Project. *Higher Education Research & Development*, 29(2), 179-193. doi:10.1080/07294360903510582
- Hallam, G., Harper, W., McCowan, C., Hauville, K., McAllister, L., & Creagh, T. (2008). *Australian ePortfolio Project, ePortfolio use by university students in Australia: Informing excellence in policy and practice* (Final Research Report August 2008). Retrieved from: <http://www.ePortfolioppractice.qut.edu.au/information/report/index.jsp>
- Hart Research Associates. (2013). *It takes more than a major: Employer priorities for college learning and student success*. Washington, DC: Author. Retrieved from https://www.aacu.org/sites/default/files/files/LEAP/2013_EmployerSurvey.pdf

- Hartwick, J. M. M., & Mason, R. W. (2014). Using introductory videos to enhance ePortfolios to make them useful in the hiring process. *International Journal of ePortfolio*, 4(2), 169-184. Retrieved from <http://www.theijep.com/pdf/IJEP123.pdf>
- Jafari, A., & Kaufman, C. (2006). *Handbook of research on ePortfolios*. Hershey, PA: Idea Group Reference.
- Joyce, S. P. (2014, March 1). What 80% of employers do before inviting you for an interview. *The Huffington Post*. Retrieved from http://www.huffingtonpost.com/susan-p-joyce/job-search-tips_b_4834361.html
- Kimball, M. A. (2003). *The web portfolio guide: Creating electronic portfolios for the web*. New York, NY: Longman.
- Lane, C. (2009). Technology and change. In D. Cambridge, B. L. Cambridge, & K. B. Yancey (Eds.), *Electronic portfolios 2.0: Emergent research on implementation and impact* (pp. 149-154). Sterling, VA: Stylus.
- Liu, Y. (2013). Economic reasons for unemployment of college students. *Proceedings of the International Conference on Education Technology and Information System, China*, 271-274. doi:10.2991/icetis-13.2013.62
- Malita, L. (2009). E-portfolios in an educational and occupational context. *Procedia Social and Behavioral Sciences*, 1(1), 2312-2316. doi:10.1016/j.sbspro.2009.01.406
- Painter, S., & Wetzel, K. (2005). School administrators' perceptions of the use of electronic portfolios in K-8 teacher hiring. *Journal of Computing in Teacher Education*, 22(1), 23-29.
- Patton, M. Q. (2015). *Qualitative research and evaluation methods* (4th ed.). Thousand Oaks, CA: Sage.
- Penny Light, T., Chen, H. L., & Ittelson, J. C. (2012). *Documenting learning with ePortfolios: A guide for college instructors*. San Francisco, CA: Jossey-Bass.
- Statista. (2016). Numbers of LinkedIn members from 1st quarter 2009 to 2nd quarter 2016 (in millions). Retrieved from <http://www.statista.com/statistics/274050/quarterly-numbers-of-linkedin-members/>
- Strauss, A., & Corbin, J. (1990). *Basics of qualitative research: Grounded theory procedures and techniques*. Newbury Park, CA: Sage.
- Strawhecker, J., Messersmith, K., & Balcom, A. (2007). The role of electronic portfolios in the hiring of K-12 teachers. *Journal of Computing in Teacher Education*, 24(2), 65-71.
- Svyantek, M. V., Kajfez, R. L., & McNair, L. D. (2015). Teaching vs. research: An approach to understanding graduate students' roles through ePortfolio reflection. *International Journal of ePortfolio*, 5(2), 135-154. Retrieved from <http://www.theijep.com/pdf/IJEP197.pdf>
- Temple, V. A., Allan, G., & Temple, B. W. (2003, November-December). *Employers' and students' perceptions of electronic employment portfolios*. Paper presented at the Joint AARE/NZARE Conference, Auckland, NZ. Retrieved from <http://www.aare.edu.au/data/publications/2003/tem03523.pdf>
- Tugend, A. (2013, June 28). What it takes to make new college graduates employable. *The New York Times*. Retrieved from <http://www.nytimes.com/2013/06/29/your-money/a-quest-to-make-college-graduates-employable.html>
- Turns, J., Sattler, B., Eliot, M., Kilgore, D., & Mobernd, K. (2012). Preparedness portfolios and portfolio studios. *International Journal of ePortfolio*, 2(1), 1-13. Retrieved from <http://www.theijep.com/pdf/IJEP33.pdf>
- Ward, C., & Moser, C. (2008). E-portfolios as a hiring tool: Do employers really care? *EDUCAUSE Quarterly*, 31(4), 13-14. Retrieved from <https://net.educause.edu/ir/library/pdf/EQM0842.pdf>
- Whitworth, J., Deering, T., Hardy, S., & Jones, S. (2011). Perceptions regarding the efficacy and use of professional portfolios in the employment of teachers. *International Journal of ePortfolio*, 1(1), 95-106. Retrieved from <http://www.theijep.com/pdf/IJEP36.pdf>
- Woodley, C., & Sims, R. (2011). ePortfolios, professional development and employability: Some student perceptions. *Campus-Wide Information Systems*, 28(3), 164-174. doi:10.1108/10650741111145698
- Yu, T. (2012). E-portfolio a valuable job search tool for college students. *Campus-Wide Information Systems*, 29(1), 70-76. doi:10.1108/10650741211192064
- Zubizarreta, J. (2009). *The learning portfolio: Reflective practice for improving student learning*. San Francisco, CA: Jossey-Bass.

KAREN WEBER, EdD, Assistant Dean of Co-Curricular Programs at the Honors College, University of Houston, has served as an administrator within honors education for over 13 years. Currently, Karen supports co-curricular and experiential learning opportunities within the Honors College. Her portfolio includes supporting students, faculty, and staff in offering experiential learning programs to undergraduates at the University of Houston. She is also overseeing a grant from the Andrew W. Mellon Foundation to establish an undergraduate research

program in the humanities. She manages the Honors ePortfolio program and teaches an ePortfolio course at the university. She enjoys consulting with faculty and staff across the university on incorporating ePortfolios into their academic programs. Karen's research interests include analyzing ePortfolios for student learning, advising, and preparing students for the workforce as well as studying co-curricular programs, high-impact practices, and experiential learning opportunities within higher education. She has presented at the Association of Authentic, Experiential, and Evidence-Based Learning (AAEEBL) annual meetings on using ePortfolios to

prepare students for the 21st century workforce and integrating ePortfolios into the university. Karen has received four university-wide staff awards during her tenure at the University of Houston.

Acknowledgements

This qualitative analysis on ePortfolios served as my doctoral study, and I benefited greatly from my dissertation committee's guidance and expertise. I am also grateful to Dr. Matthew Fowler for his willingness to let me work from his compelling and well-structured study on ePortfolios.

Appendix
Interview Questions

Interview Questions
1. Please share with me some information about your company and your role at your company.
2. Which pages or sections were most interesting to you?
3. Which pages or sections were least interesting to you?
4. What do you consider to be the strengths of an ePortfolio?
5. What do you consider to be the drawbacks of an ePortfolio?
6. What aspects of the ePortfolio would be MOST helpful to your decision-making process?
7. What aspects of the ePortfolio would be LEAST helpful to your decision-making process?
8. Could you better determine the skills of a job applicant who has an ePortfolio compared to traditional candidate screening methods?
Probe: In which ways can you better determine these skills?
9. Do you believe an ePortfolio would make a difference in how candidates are evaluated?
Probe: How would it make a difference?
10. What elements would you like to see in an ePortfolio? Please describe them.
11. Do you think an ePortfolio offers enough components to represent an applicant effectively?
If not, what would you include?
12. Do you have any suggestions for improving and/or streamlining the ePortfolio?
13. What guidance would you provide applicants to help them make the ideal ePortfolio? Please give some examples.
14. How should a candidate notify you of the existence of an ePortfolio?
15. Would you use this ePortfolio, or parts of it, in the hiring process? Yes No If so, how?
16. If you would use the ePortfolio, or parts of it, would you use it in any of the following ways?
i. An initial screening device
ii. Just prior to an interview
iii. Following an interview
iv. And/or in another way
17. If you would not use the ePortfolio, why not?
18. If you would not use the ePortfolio, can you see a way in which you might use an ePortfolio in the future? Consider both modifications to the ePortfolio and changes in the way you might approach hiring in the future.
19. Approximately how much time is spent currently reviewing a candidate's application materials?
20. How would introducing an ePortfolio into the process affect the time spent in reviewing a candidate's application materials?
21. Approximately how long did you spend viewing the ePortfolio?

Manhattanville College's Atlas Program: Designing a Road Map to Success in College and Beyond

Alison S. Carson, Gillian Greenhill Hannum,
and Christine Dehne
Manhattanville College

After a two-year reboot of a 40-year portfolio tradition, Manhattanville College has moved from a required, one-size-fits-all undergraduate portfolio to a series of developmentally-scaffolded ePortfolio courses. This new approach allows students to reflect upon and integrate their learning at the first-year, sophomore, junior, and senior levels, as well as around Study Abroad, Internship, and Service Learning experiences, thus helping them link their educations to their personal and career goals and aspirations. With the help of faculty, alumni, and employer mentors, students are supported in their transition from high school to college and from school to work, developing a community of practice around reflection, self-assessment, self-presentation, and communication. This paper will examine the use of design thinking as a process guiding program development and revision, as well as look at the unique features of the courses offered at each level of student development.

Manhattanville College introduced its Portfolio System in the early 1970s as part of the *Manhattanville Plan*, a National Endowment for the Humanities-funded revision of the College's undergraduate curriculum (Manhattanville College, 1973). Originally conceived as both a vehicle that allowed students to propose individualized programs of study and a way to assess student learning, the student portfolio's role is articulated in the preamble to the plan itself:

Whereas the college recognizes and confirms the need for a fuller and more precise qualitative evaluation of the academic achievements of its students, namely, that each student demonstrate a critical faculty, independence of mind, and competence in at least one field of humanistic studies, be it resolved that the college require, as a condition of the awarding of the degree, that each of its students present a portfolio containing the following evidence of the student's achievement. (Manhattanville College, 1973, p. 18)

Initially, the evidence focused on critical reasoning in the major field of study, mastery of bibliographic and research methods, evidence of independent study, and—in keeping with the concept of breadth in the liberal arts—evidence of mastery beyond the introductory level in two additional fields of study. Thus, the Portfolio System served as the college's "distribution requirements" (Manhattanville College, 1973, p. 19). An early adopter of "evidence-based learning," Manhattanville required students to show evidence of mastery by including papers, exams, photographs of artwork, musical tapes, films, and so forth in their portfolios (Manhattanville College, 1973, p. 19). An elected faculty committee, the Board on Academic Standards, reviewed student portfolios in the

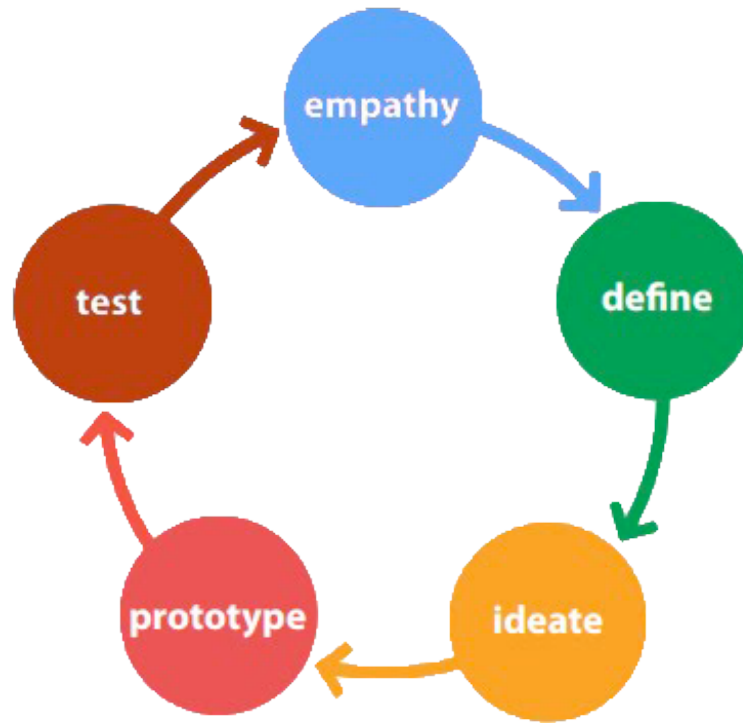
sophomore and senior years. Approval of the senior portfolio was required for graduation; no course credit was attached to this requirement.

By the early 1990s, a new generation of students began to chafe at what faculty fondly called "the creative ambiguity" of the Portfolio System. A set of more clearly defined distribution requirements was added, and as the student body grew, the role of the Portfolio as the centerpiece of the curriculum began to break down. Over the next few decades, although it remained a requirement, the Portfolio was increasingly at the margins of student experience—a hoop to be jumped through in order to graduate, but one that many students thought little about until the submission deadline came (and sometimes went). The administration came to see it as costly to enforce, and the faculty, whose advising and teaching loads had increased, had little time to devote to helping their advisees develop meaningful portfolios. At the end of the 2013-14 academic year, with encouragement from the then-president and provost, the faculty voted to suspend the program (for a deeper examination of the decline of the Manhattanville Portfolio System and the important lessons learned that allowed us to bounce back, see Carson, Dehne, & Hannum, in press).

The Designing Process

In the fall of 2014, the Board on Academic Standards, now charged with creating a replacement for Manhattanville College's 40+-year-old Portfolio System, began its new work; the charge itself was vague, the only parameters being that the committee create something optional and credit-bearing. Realizing that buy-in to whatever it created was necessary, the committee attempted to take the needs of the entire community into account, which led them to approach

Figure 1
Design Thinking Principles Illustrating the Cyclical Nature of Iteration



Note. Adapted from d.school (n.d.).

the challenge as a design thinking exercise, following a process defined by Stanford University's d.school (2010; Figure 1). The adoption of the design-thinking methodology by this committee was largely due to two of the committee members having a background in devised theater, and one of the members having an understanding of Agile development. A common focus on the needs of the audience/user/stakeholder and the concept that iterations/prototypes/consistent refinement are the means to a satisfactory end tie these three methodologies together (Cooper-Wright, 2016; Lahey, 2018; Oddey, 1996). The term "design thinking" will be used for the purposes of this discussion as it has achieved a broader base of accepted use, while "devising" is generally limited to theater and "Agile" to software development. The design principles of Empathize, Define, Ideate, Prototype, and Test were guides to the development of our Atlas program, an optional and credit-bearing, four-course scaffolded pathway to graduation and life-long learning. The design process will also be used as a roadmap for our story about the evolution of our Atlas program, its goals, and the integration of ePortfolio as an integral defining feature of the program.

Empathize

Empathy emphasizes the need to "understand the people for whom you are designing" (d.school, n.d., p. 1) with an ultimate goal of designing positive experiences in response to specific user needs rather than a goal of designing a product (Brown, 2009; Brown & Katz, 2009). Starting with emails, in-person invitations, and a series of phone interviews, the committee connected with users of the old Portfolio System to understand where things went wrong and what was needed in a new system. Speaking with faculty, students, alumni, and staff, the committee was able to collect a variety of perspectives reflecting what these different groups understood as existing problems of the suspended Portfolio System and the aspirational needs of a new program.

Define

During this phase, the goal is to "unpack and synthesize your empathy findings into compelling needs and insights" (d.school, n.d., p. 2). The designer uses input from the stakeholders to define the experience that is needed, coming up with a list of issues that concern those stakeholders (Buchanan, 1992). With a deeper

understanding of what our primary stakeholders viewed as important, we began to define the elements to be included in the new program. It became clear that there were some elements of the old Portfolio System that should be retained, including academic planning documents and an emphasis on reflection, as well as new elements that should be added, such as career planning and digital identity development.

Academic planning. Our stakeholders wanted us to provide support to students transitioning to their new college environment, including introduction to college resources, advising support, and academic planning. Cuseo (2014) identified first-year programs that support the transition of high school graduates into the college environment through an emphasis on both academic and personal development as most effective, as measured by academic success and student retention. This effect appears to be due to embedded efforts to connect students with on-campus resources such as tutoring services and other learning support resources. A survey done by the National Survey of Student Engagement (2005) found that students who participated in first-year programs were more likely to engage with and derive satisfaction from academic advising and career advising and planning. With this knowledge, as well as our own past experience, we saw that embedding academic planning into our new program was fundamental moving forward.

Career planning. We heard from our stakeholders the importance of mindful and intentional connections between one's liberal learning and career planning. The connection between the liberal arts and career has not always been an easy one; liberal arts colleges have received significant criticism for not preparing students adequately for careers. Headlines such as "America's 'No Confidence' Vote on College Grads' Work Readiness" (Busteed, 2015), "Many Business Leaders Doubt U.S. Colleges Prepare Students" (Sidhu & Calderon, 2014), and "Skills Learned in School Differ From Those Demanded at Work" (Badal, 2016) all contribute to what has been called higher education's "workforce preparation paradox" (Busteed, 2014). This paradox is demonstrated by recent Gallup poll findings that show that while 96% of chief academic officers polled stated that they felt their institutions were very or somewhat effective at preparing their students for the world of work (Gallup & Inside HigherEd, 2014), only 14% of Americans felt that college graduates were well prepared for work (as cited in Busteed, 2014). Even more telling is that only 11% of business leaders strongly agreed that "Higher education institutions in this country are graduating students with the skills and competencies that MY business needs" (Gallup/Lumina Foundation, 2014, p. 23).

Interestingly, most of the competencies and skills developed in higher education are, in fact, the same ones

that employers say that they desire in their employees. For example, the Association of American Colleges and Universities found in a 2015 study that at least 80% of employers agreed that oral and written communication and critical thinking skills are very important (Hart Research Associates, 2015). The National Association of Colleges and Employers (NACE) has defined skills needed for "career readiness" (NACE, 2014), including critical thinking/problem solving and oral and written communication. These same skills are at the educational core of most institutions of higher education (Hart Research Associates, 2015; NACE, 2014).

This "work preparation paradox" (Busteed, 2014) might better be understood as an issue of awareness and translation. For example, an Association of American Colleges and Universities (AAC&U) survey found that while students seem to be aware of what learning outcomes are most important to employers, they perceive themselves as more prepared for the world of work than do employers (Hart Research Associates, 2015). Perhaps, through reflection, students may develop greater awareness and understanding of their own preparedness: what they know and what they do not know. They could then use this information to develop new skills and knowledge—in other words, the skills of life-long learners. Selingo (2016), who has written on the need for institutions of higher education to redesign with a goal of increasing students' active participation in becoming career-ready in a quickly changing workforce, identified important skills graduates need, as described to him by employers. First and foremost, he identifies the importance of being a life-long learner. Employers cannot depend on what students know in an ever-changing landscape; rather, they need graduates who know how to learn new things. Reflective practice emphasizing inquiry, reflection, and integration is a key ingredient of continuous learning and career readiness (Eynon & Gambino, 2017; Selingo, 2016).

Digital identity. Our stakeholders felt that, in anticipation of applying for jobs or graduate school, students needed to create a digital identity that demonstrated their learning, ultimately representing their personal brand to outside audiences (Jones, 2017). Our history of using paper portfolios, and our experience with ePortfolios on our campus (i.e., we were members of the Making Connections and Connect to Learning grants through LaGuardia Community College; see Carson et al., in press), made using ePortfolios as a vehicle for reflection and integration as well as a platform for professional presentation an easy choice.

Using ePortfolios supports making students' learning more visible to themselves (Eynon, Gambino, & Török, 2014), as well as to additional audiences. While we often hear today's students referred to as "digital natives" (Barkho, 2016), in fact, they have a great deal to learn about self-presentation and gearing

their message to specific audiences. Recent research also shows that ePortfolios are becoming increasingly recognized and valued by recruiters. Leahy and Filiatrault (2017) found that 85% of recruiters surveyed “reported that, if students followed up with them via e-mail with a link to a relevant part of their ePortfolio, they would visit the link” (p. 219). Recruiters also stated that if students provided a link to their ePortfolio on a cover letter, e-mail signature (73%), or resume (72%), they would make the effort to review the ePortfolio (Leahy & Filiatrault, 2017). ePortfolio practice supports the advancement of many needs and goals identified by our stakeholders, from reflection and integration of learning (Eynon & Gambino, 2017), to developing meaning and identity through narrative (Buyarski, 2014) and self-authorship (Baxter Magolda, 2014), to personal branding.

Indeed, the power of ePortfolio pedagogy recently was recognized by George Kuh and added as the eleventh High Impact Practice (HIP; Eynon & Gambino, 2017; Kuh, 2008; Watson, Kuh, Rhodes, Light, & Chen, 2016). Kuh (2017) noted that:

The ePortfolio is much more than a just-in-time twenty-first-century electronic record keeping system. It is an intentionally designed instructional approach that, among other advantages, prompts students to periodically reflect on and deepen what they are learning and helps them to connect and make sense of their various experiences inside and outside the classroom that—taken together—add up to more than the sum of their parts. (Foreword to Eynon & Gambino, 2017, p. ix)

Reflective practice. As suggested by the quote above (Kuh, 2017), supported reflection is a key element to making connections between past and future learning and integrating that learning across contexts. Reflective practice is also the foundation of the development of a useful academic or career plan and a robust digital identity. To make these connections, we recognized the importance of developing in our students a reflective practice that allows them to evaluate critically past learning, supporting self-assessment and future decision-making. Our understanding of reflection has been guided by Carol Rodgers’s (2002) model, which is based on the work of John Dewey.

Rodgers (2002) defined reflection, in contrast to a superficial “mulling over” (p. 849), as a rigorous, systematic, and disciplined cycle of practice. Reflection begins with organized prompts directing students to identify a specific experience. Additional prompts guide students in the process of inquiry around this experience to develop a deeper and richer understanding of it. Experiences at their root are interactions with the world that leave us changed (Rodgers, 2002), and this reflective

process helps students to make visible the changes that result from their experiences (Eynon et al., 2014).

Similarly, Eynon and Gambino (2017) foreground reflective practice with their inquiry, reflection, and integration cycle, which serves as the foundation for the Catalyst for Learning Framework (see Figure 2). Through this process, students are guided, systematically and intentionally, to inquire and question previous learning and to connect and integrate these learning experiences in order to look forward and apply, or integrate, them with future learning opportunities (Eynon & Gambino, 2017). It was clear that systematic reflection should be a fundamental attribute of the Atlas program; structured into each Atlas class would be multiple reflection assignments emphasizing the importance of developing a reflective practice. With clarity around the elements that needed to be included in our program, our next step was to figure out how to design a format to support these learning priorities.

Ideate

With clearly defined needs and goals, the faculty committee began to ideate, brainstorming a number of different ways to meet these goals within the constraints of their charge, an optional and credit-bearing model. In order to have a credit-bearing program, it quickly became evident that the committee was building at least one course. We also learned from our interviews that we were trying to meet too many objectives in our previous Portfolio System, so we decided to scaffold the content and concepts into multiple courses instead of a single course. We had conversations about collaboratively taught classes, debates over how many credits the courses should be worth, and discussions about whether it would be necessary to take the courses in a particular sequence. This phase is an essential step in the design thinking process, as it forces the design team beyond obvious solutions into the potential for innovation and is the transition from research to creation (Dam & Siang, 2017).

Prototype

Following the ideation phase, the committee settled on a prototype, or model, designed to meet the previously defined goals. Our model included four scaffolded courses, each intended to meet the needs and challenges of students in one of the four years of college. Similar to the guided pathways models (Bailey, Jaggars, & Jenkins, 2015) implemented on a number of campuses nationally, together these four courses provide a clear program map aligned with student end goals (e.g., choosing a major, identifying a career). Each course builds on the learning objectives of the previous one,

moving students on a clear pathway to graduation and the world of work. All courses are also aligned with the program's common learning outcomes (Bailey et al., 2015). Like many guided pathway programs, our program includes active and intentional advising.

Passport, a course designed for first-year students, supports them as they transition to college life and begin to develop their reflective practice. *Pathfinder*, a course for sophomores, supports academic planning and encourages intentional exploration of potential majors while making connections with possible careers. *Compass*, our junior course, is geared toward students examining their liberal learning and actively connecting and integrating learning experiences outside of the classroom with professional goals. *Pursuit*, for seniors, builds on the previous courses, culminating in an external-facing ePortfolio communicating their learning and personal brand to potential employer audiences. Thus, the first two years focus on helping students to design their own college learning experiences, and the second two years help students to design their lives after college.

Passport. As we developed Atlas, we were fortunate that we already had the basics of our first-year course in place. In the spring of 2013, as a result of a Foundations of Excellence® self-study through the John N. Gardner Institute for Excellence in Undergraduate Education, Manhattanville had piloted two “transitions” courses for freshmen. These elective courses were designed to complement our existing First-Year Seminars and First-Year Writing classes and were taught by a team of faculty and staff members. At the time, we were participating in the FIPSE-funded Connect to Learning grant, and so we developed these courses to be ePortfolio-based. Foundations of Excellence®, among others (e.g., Cuseo, 2014), has identified holistic, transitions-type First-Year seminars as having the greatest positive impact on retention and student success (Cuseo, 2014). In particular, FYPs supporting educational planning, goal-setting, and career exploration have been linked to increased student retention. Student commitment to educational and career goals is “perhaps the strongest factor associated with persistence to degree completion” (Wyckoff, 1999, as cited in Cuseo, 2014, p. 7).

The fall course, which would become Passport A, was designed to introduce students to the history and mission of Manhattanville and to campus resources that would help them be successful in college, as well as develop self-awareness and goal-setting practices. Students would hear panel presentations, attend campus activities, and visit campus program offices like the Writing Center, the Counseling Center, and the Center for Career Development. They could use their ePortfolios as spaces to reflect, to document their goal-setting activities, and to post assignments. Passport B, for second-semester students, was planned to continue

with self-assessment, now in the context of possible majors and careers, civic engagement and community service, and intercultural communication, calling for collaboration with the Center for Career Development, the Duchesne Center for Religion and Social Justice, and the Center for Inclusion, among others.

Pathfinder. This ePortfolio-based course was designed to aid sophomores in the selection of a major, academic planning, and career exploration. In the course, students are supported as they clarify the purpose, meaning, and direction of their college educations and explore career possibilities related to those decisions. The textbook for the course is *Designing Your Life: How to Build a Well-Lived, Joyful Life*, written by instructors at Stanford's d.school (Burnett & Evans, 2016). Several exercises from the book make good course activities, specifically the “Goodtime Journal” (Burnett & Evans, 2016, pp. 50-54), “Mind Mapping” (pp. 70-74), and “Odyssey Planning 101” (pp. 96-98). Students are asked to consider why they are at a liberal arts college, what they hope to do after college, and how their current experiences might aid them in attaining their goals. Additionally, students reflect on personality, interests, goals, strengths, and weaknesses and use these assessments to select a major and to begin to think about possible careers. They are asked to set academic goals, inventory their existing skills, and connect with faculty within their major for feedback on and assessment of these plans.

Academic planning plays a significant role in supporting these learning objectives. Our stakeholders continued to support the academic planning component of the old Manhattanville Portfolio System, agreeing that the Four-Year Study Plan was one element that should be retained. Unlike an automated degree audit, completion of the Study Plan, a requirement of this course, compels students to think through the various pathways they might take to graduation and plan their courses (e.g., major, minor, and core curriculum requirements) and co-curricular experiences (e.g., study abroad and service learning).

Compass. This course is designed to help students reflect on co-curricular experiences, with the goal of translating and documenting leadership and team-building skills, showcasing creative work, highlighting unique experiences, and relating these experiences to desirable career skill sets, which is especially crucial in the 21st century (Kuh, 1995). The intent of this course is for students to integrate knowledge gained in and outside the classroom and apply it to solve practical, real-world problems.

Through research and informational interviews, students investigate career options of interest, determining the skills and characteristics needed for success in their chosen fields. A series of guest speakers

from across the campus helps students explore key characteristics, including: civic engagement, leadership, teamwork, creativity, ethical reasoning, and intercultural communication. Each student then selects an extra-curricular or co-curricular experience in which they participate and examines it in terms of organizational culture, skills, and competencies developed through participation, and of ethical issues that might arise (Kuh, 1995). Finally, students curate professional ePortfolios, which seek to integrate learning from their academic, co-curricular, and extra-curricular activities.

Pursuit. Pursuit is designed to identify or affirm a career path. Students begin by identifying significant learning experiences within and beyond their major. Through a series of mapping activities and reflections, these experiences are mined for skills, knowledge, and mindsets that have been developed through participation in learning. All too often, students have a superficial understanding of the hard skills learned, and little understanding of the soft skills developed along the way. For example, while students recognize their improvement in written communication as they learn to write a literature review, they may not recognize the additional skills developed, such as critical thinking acquired through analysis of previous research methodologies and findings, digital literacy skills in searching for scholarly literature, and the beginnings of a systems mindset, putting various pieces of research together in a way that creates a larger and more comprehensive understanding of the issue at hand. They may also fail to recognize that a group project, often loathed by students, serves to develop collaboration and leadership skills.

Generative knowledge interviewing (Peet, Walsh, Sober, & Rawak, 2010) is practiced throughout the course as a specific and intentional way for students to uncover these areas of tacit knowledge and skills. With a deeper, fuller, and richer understanding of their own learning, students begin to generate short stories connecting learning experiences with the products of that learning. Considerable time is then spent “translating” their learning stories into the language of employers. Résumé and cover-letter preparation, interviewing skills, employment seeking, personal branding, and networking are understood as ways of communicating their learning stories in a language understood by employers. A storytelling metaphor is also used as students develop a professional online identity using Digication's ePortfolio platform. Across the semester, students receive visits from faculty and staff to discuss such topics as career planning, resume reviews, hiring and benefits, and even personal finance.

As can be seen, each of these courses is a more rigorous and intentional iteration of the previous course, supporting the development of reflective practice and

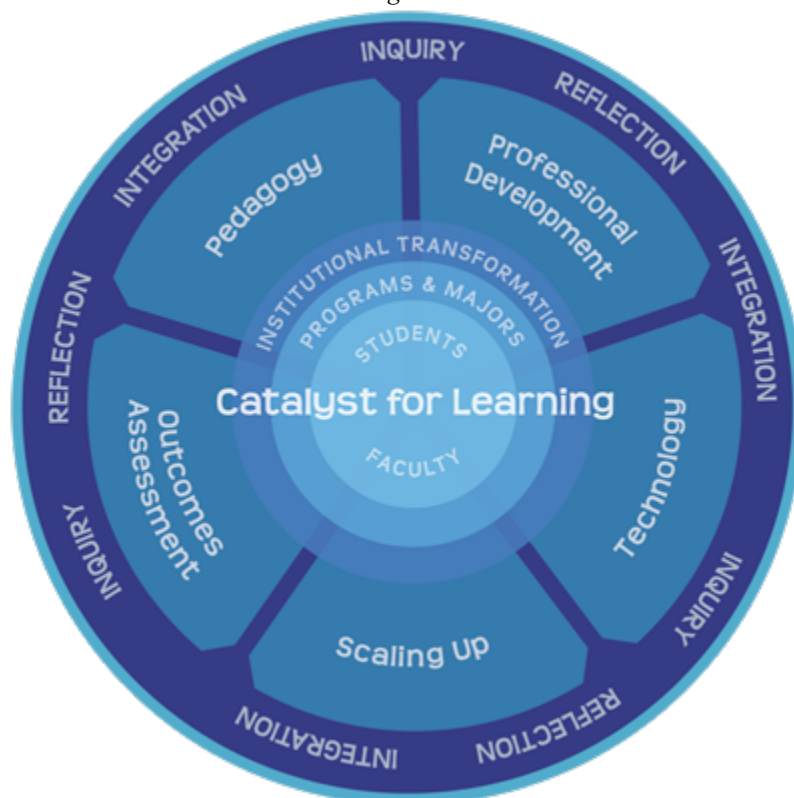
the creation of a digital identity. The practices involved in the Atlas program connect with many “high-impact behaviors,” as defined by George Kuh (2008). For example: students invest meaningful time and effort into the process of inquiry, reflection, and integration, discuss serious topics such as ethical decision making with faculty members and classmates, and develop intercultural communication skills, essential in today's diverse workforce.

Test

With a prototype in place, we piloted each new course, rolling out one to two new classes each semester. The use of pilots allowed for a fluid assessment and revision process, with courses evolving before the next time they were offered and allowing for lessons learned in each class to inform the development of others. For example, while the Four-Year Study Plan was originally part of Pathfinder, the sophomore level course, early feedback from faculty and students allowed us to introduce easily the Study Plan in the Passport class earlier in a student's career. Serendipitously, at this same time, the Office of Academic Advising and Digication, our ePortfolio platform, were collaborating to create an ePortfolio advising template, embedding the four-year plan, for all students at the College. Thus, ePortfolio now serves as an early advisement tool to help all first and second-year students manage/track their academic progress under the guidance of a professional advisor before transitioning into their majors/programs of study. According to *Academic Advising: A Comprehensive Handbook*, technology provides “a tool that fosters the developmental advising process and promotes students' responsibility for their academic careers” (Sotto, 2000, p. 253). Upon declaring a major, students transition to a faculty advisor. Their advising ePortfolio with its four-year plan goes with them, smoothing the transition between general and major field advisors. Kuh (2006) and Buyarski and Ross (2002) suggested that when academic advising is a shared activity across many partners (e.g., professional advisor, faculty advisor, first-year program mentor, peer mentor), a strong safety net is created for the developing student. The use of ePortfolio allows for this “tag-team” (Kuh, 2006) approach. Now, with testing and revision, an intentional advising process using ePortfolio is incorporated into our Passport course.

One thing that we realized during testing was that staffing of the courses was going to be a challenge. When we put out a call for people to teach in the program, despite large numbers of faculty claiming excitement and support, we were not inundated with volunteers. Fortunately, at this point in our program development, we received a two-year, \$100,000 grant

Figure 2
The Catalyst for Learning Framework Illustrating the Foundational Elements of Inquiry, Reflection, and Integration



Note. From High-impact ePortfolio practice: A catalyst for student, faculty, and institutional learning, by B. Eynon and L. Gambino, 2017, p. 33. Copyright 2017 by Stylus. Reprinted with permission.

from the Andrew W. Mellon Foundation, which supported course development, faculty development, and the purchase of some technology to support student exploration in making audio and video files for their ePortfolios. The Mellon grant also supported travel by a number of team members to conferences, where we were able to share ideas and experiences with other members of the ePortfolio community as we tested the various courses.

With two years of testing behind us, Atlas is up and running as an optional, credit-bearing School of Arts and Sciences program with courses at all levels offered on a regular cycle. Its primary goals are:

- To support students as they reflect on experiences, develop goals, and make connections between what they have already accomplished and what they hope to accomplish;
- To aid each student in the creation of an online space in which they can showcase their accomplishments and illustrate the correlations

they are making between their various experiences;

- To encourage professional practices in networking and social media usage by students; and
- To connect students with campus resources and with professionals in the student's field of interest.

Assessment. Assessment serves as a formalized way to engage the Test principle of design thinking with regard to our learning outcomes. Each time an Atlas course is taught, we reiterate the design cycle, gathering information from students and faculty about their evaluations of the coursework, learning goals, and outcomes, connect this information to our defined learning outcomes and program goals, and then revise as a result of this examination (see Figure 1). This process can also be described in terms of the inquiry, reflection, and integration process described by Eynon and Gambino (2014, 2017) (see Figure 2). Systematic interrogation of our learning, and application and integration of that assessment, is fundamental to a

learning college (Eynon & Gambino, 2017). Regardless of the terminology used, both emphasize assessment *for* learning as the end goal.

ePortfolios provide a unique opportunity for student learning assessment (Kuh et al., 2015). As examples of authentic student work, ePortfolios present a holistic view of student learning, showing evidence of a variety of learning outcomes and the connections among learning experiences rather than isolated and compartmentalized skills and knowledge (Suskie, 2009). Assessment of the Atlas program started with inquiry into our programmatic goals (see above). The creation of ePortfolios as an online space in which students showcase their accomplishments meets a learning outcome for both the Atlas program and Manhattanville's core curriculum Digital Literacy capability. Students are not only creating content using technology, but they are also learning to communicate effectively to specific audiences in a digital medium.

We began with an examination of students' final ePortfolios from three Atlas courses, evaluating the use of artifacts, reflective analysis of artifacts, ePortfolio navigation, use of multimedia, and so forth. Instructors from across the program reviewed the ePortfolios using our ePortfolio rubric (see Appendix), which was developed by the Board on Academic Standards. Following the assessment, Atlas instructors discussed the results together. As a team, the instructors found that the assessment results suggested that students needed more support choosing representative artifacts demonstrating their learning. Additionally, greater emphasis on multimodal skills was needed, supporting the integration of audio, video, and imagery into student ePortfolios. Students also needed more help thinking about various audiences and how one's ePortfolio might vary as a function of audience.

Using Biggs's (2014) theory of constructive alignment, the Atlas team began the process of examining the relationships between the learning outcomes, the teaching activities designed to support those learning outcomes, and the measurements of the learning outcomes (assessment). If students are not meeting the learning outcome regarding final ePortfolios established for the program, then we need to make adjustments in the learning outcome itself, the learning activities supporting the outcome, and/or the measurement of the learning outcome (our ePortfolio rubric). This first time around, we have made adjustments to our teaching and learning activities, agreeing to emphasize the importance of artifacts and multimodal aspects of an ePortfolio and to engage students in deeper conversations about considerations of audience. These adjustments can also be thought of as the integration of our own learning from the assessment/reflection process, as suggested by Eynon

and Gambino's (2017) I-R-I process. While assessment can be used for accountability purposes (are we meeting the assessment criteria for accreditation?), as well as institutional learning purposes (does this program support our institutional learning goals and mission?), our early programmatic assessment emphasizes revision and improvement of our prototype, strengthening the connections and alignment between our programmatic and course-level learning outcomes, improving our teaching and learning strategies, and course-correcting our learning assessment tools. With a bit more time and data, we will begin the meaningful task of connecting our program's learning outcomes with institutional outcomes: Does participation in the Atlas program support improved student retention and success? Does participation in this program lead to increased success in employability? Does this guided pathway lead to faster completion rates? We are excited to examine the success of our program through this lens.

There are additional, anecdotal ways of measuring the success of our program: Are students taking our courses at increased rates? Do students view these courses as beneficial to their development? It is still early to tell, but we have added additional sections of the courses due to increasing student demand. Over the course of two years, our spring course registrations have grown from 14 to 71 students, and our fall course registrations have grown from 119 students to 136 (different courses are offered in the fall and spring semesters). Currently, about one quarter of our entering freshmen take a Passport class their first year, and increasing numbers of students are enrolling in more than one Atlas class; a quarter of all students who take a Passport course go on to take another Atlas course. Additionally, data analysis has shown that students who take an Atlas class in the first year have, on average, a fall-to-spring persistence rate of 86%.

Student reflections and course evaluations are generally positive. Final reflections suggest that we are meeting the program goal of facilitating students as they reflect on experiences, develop goals, and make connections between what they have already accomplished and what they hope to accomplish. As one student explained her experience in an Atlas class:

When I originally started this class, I could see the value of it, but I had no idea just how helpful this course would prove to be. Now, at the end of the semester, I have realized that this course has truly helped me to reflect on my college experience. In many ways, the process of creating and presenting a professional e-Portfolio has encouraged me to think cohesively about the last four years. As graduation day approaches, I am thankful for the closure and clarity this portfolio has allowed me as I begin the next chapter of my life (Muckell, 2017).

The design thinking process is intentionally iterative, with each principle both building on the previous step as well as supporting deeper learning and understanding of the information learned in previous steps (d.school, n.d., p. 5). The testing of our four-course prototype led us to understand better the needs and challenges of our stakeholders, and our deeper empathy led to the development of additional course prototypes.

Study abroad and Duchesne 4th credit option.

Some of our specialized learning opportunities, such as study abroad and service learning, also provided opportunities for integration into the Atlas curriculum. Collaborating with the Director of Study Abroad, we proposed requiring all students enrolling in a cooperative study abroad program to enroll simultaneously in a one-credit Atlas class. Through pre-trip and post-trip reflections and assignments requiring them to document their observations and experiences while abroad, students' learning while at their host institutions is visible to their advisors and the Study Abroad Director at home, as well as to their peers at other locations around the world. Study abroad has been identified as a High Impact Practice (HIP) by AAC&U (Kuh, 2008), but prior to our adoption of the ePortfolio pedagogy, it was not as well assessed as it could have been in terms of its learning outcomes. Atlas study abroad facilitates students' reflection on how to understand and utilize their cross-cultural and global experience, supporting an internationalized mindset for academic and career success in a global environment.

Service learning, another HIP, was even more in need of a vehicle to integrate it into a student's overall education. At Manhattanville, students may enroll in what is called the 4th Credit Option, allowing them to earn an additional credit by engaging in 30 hours of community service related to one of the courses in which they are enrolled that semester. Coordination between the sponsoring faculty member and the Duchesne Center for Religion and Social Justice, which oversees the program, was often challenging, and the faculty member frequently did not have much insight into the student's activities outside the classroom until he or she gave an end-of-semester presentation. Now, the Duchesne 4th Credit Option is an Atlas course; students post weekly reflections, and respond to prompts about their experiences in the field, and the faculty sponsor and the Director of the Duchesne Center can follow the students' experiences on a daily basis. Again, the adoption of ePortfolio improves the data we are able to collect and analyze as we assess this learning experience and examine service learning and civic engagement

and its potential transformations of participating students as well as communities.

While not yet required across the College, many departments are moving towards an Atlas-informed approach to documenting Internship experiences using ePortfolios. Our team is currently working with the Center for Career Development to facilitate this evolution.

Iterating Forward

While early indicators suggest that Atlas is meeting a real need for Manhattanville students, our testing has revealed that the program is not without its challenges. The first is that of sequencing activities, goals, and practices in an optional set of courses. In other words, while the courses are scaffolded, providing a clear path for development over time, students are not required to take all of them (or even any of them). To some extent, this undercuts the careful developmental layout of the program; however, because each class is designed to be appropriate to students at a specific point in their educations, experience is showing that students who jump in as juniors or seniors catch on quickly.

Perhaps more pressing is the challenge of staffing the program, especially with full-time members of the faculty. At the moment, Passport classes are taught by Student Affairs staff members and members of the Academic Advising staff; we have four full-time faculty members who teach in Atlas. Faculty development workshops and outside speakers funded by the Mellon grant have introduced Atlas pedagogy to a broader segment of the faculty (see Carson et al., in press), but willingness to sign on to teach in the program remains limited. We could likely fill more sections if we had faculty members to staff them. Scaling up is always a challenge, particularly for a small liberal arts institution with a tight budget; however, we do have the support of the most recent institutional strategic plan. Embedded in the plan, endorsed by our new president and the Board of Trustees, are at least two initiatives directly supportive of the Atlas program. One goal emphasizes the integration of high-impact practices through our undergraduate curriculum; the other calls directly for the integration of the Atlas program "with the First-Year Program, core curriculum, and capstone, thereby establishing a streamlined, integrative and scaffolded vertical structure" (Manhattanville College, 2016, p. 6) designed to provide pathways and support students in pivotal transitions, support reflection and integration, and incorporate design thinking processes. Six pilot sections of a newly-designed First-Year seminar incorporating Atlas pedagogy are being planned for Fall 2018. With this wind at our backs, we are hopeful for improved support as we iterate forward in our learning journey.

References

- Badal, S. B. (2016, January 26). Skills learned in school differ from those demanded at work. *Gallup News*. Retrieved from <http://news.gallup.com/businessjournal/188828/skills-learned-school-differ-demanded-work.aspx>
- Bailey, T., Jaggars, S. S., & Jenkins, D. (2015). *What we know about guided pathways*. New York, NY: Columbia University, Teachers College, Community College Research Center.
- Barkho, G. (2016, June 20). What exactly makes someone a “digital native”? A comprehensive guide. *Mashable*. Retrieved from <https://mashable.com/2016/06/20/what-is-a-digital-native/#bEjUiAvxGmq0>
- Baxter Magolda, M. B. (2014). Self-authorship. *New Directions for Higher Education*, 154(166), 25-33.
- Biggs, J. (2014). Constructive alignment in university teaching. *HERDSA Review of Higher Education*, 1, 5-22.
- Brown, T. (2009, July). *Tim Brown at TEDGlobal 2009: Designers—think big!* [Video]. Retrieved from https://www.ted.com/talks/tim_brown_urges_designers_to_think_big#t-570050
- Brown, T., & Katz, B. (2009). *Change by design: How design thinking transforms organizations and inspires innovation*. New York, NY: HarperCollins Publishers.
- Buchanan, R. (1992). Wicked problems in design thinking. *Design Issues*, 8(2), 5-21. doi:10.2307/1511637
- Burnett, B., & Evans, D. (2016). *Designing your life: How to build a well-lived, joyful life*. New York, NY: Alfred A. Knopf.
- Busteed, B. (2014, February 24). Higher education's work preparation paradox. *Gallup News*. Retrieved from <http://news.gallup.com/opinion/gallup/173249/higher-education-work-preparation-paradox.aspx>
- Busteed, B. (2015, April 24). America's “no confidence” vote on college grads' work readiness. *Gallup News*. Retrieved from <http://news.gallup.com/opinion/gallup/182867/america-no-confidence-vote-college-grads-work-readiness.aspx>
- Buyarski, C. (2014). *Reflection in the first year: A foundation for identity and meaning making*. Retrieved from <http://iupui.mcncr.org/ref-practice/>
- Buyarski, C., & Ross, F. (2002). Advising collaborations: The key to student success. *Academic Advising Today*, 25(2). Retrieved from <http://www.nacada.ksu.edu/Resources/Academic-Advising-Today/View-Articles/Advising-Collaborations-The-Key-to-Student-Success.aspx>
- Carson, A. S., Dehne, C., & Hannum, G. G. (in press). Rising from the ashes: Blazing a new trail for the Manhattanville Portfolio tradition. In B. Eynon & L. Gambino (Eds.), *Catalyst in action: Case studies of high-impact ePortfolio practice*. Sterling, VA: Stylus.
- Cooper-Wright, M. (2016, November 24). The blurring between design thinking and Agile. *Frontline Interaction Design*. Retrieved from <https://medium.com/front-line-interaction-design/the-blurring-between-design-thinking-and-agile-ae59d14f28e3>
- Cuseo, J. (2014). *The empirical case for the first-year seminar: Promoting positive student outcomes and campus-wide benefits*. Retrieved from <https://www.researchgate.net/publication/268189042>
- Dam, R., & Siang, T. (2017). *What is ideation—and how to prepare for ideation sessions*. Retrieved from <https://www.interaction-design.org/literature/article/what-is-ideation-and-how-to-prepare-for-ideation-sessions>
- d.school. (2010). *An introduction to design thinking: Process guide*. Retrieved from <https://dschool-old.stanford.edu/sandbox/groups/designresources/wiki/36873/attachments/74b3d/ModeGuideBOOTCAMP2010L.pdf>
- d.school. (n.d.). *Bootcamp bootleg*. Retrieved from <https://dschool.stanford.edu/resources/the-bootcamp-bootleg>
- Eynon, B., & Gambino, L. (2017). *High-impact ePortfolio practice: A catalyst for student, faculty, and institutional learning*. Sterling, VA: Stylus.
- Eynon, B., & Gambino, L. (2014). Catalyst for learning: ePortfolio-based outcomes assessment. *NILOA: Making Learning Outcomes Usable and Transparent*. [blog] Retrieved from <https://illinois.edu/blog/view/915/111700>
- Eynon, B., Gambino, L., & Török, J. (2014). What difference can ePortfolio make? A field report from the Connect to Learning Project. *International Journal of ePortfolio*, 4(1), 96-105. Retrieved from <http://www.theijep.com/pdf/ijep127.pdf>
- Gallup, & Inside HigherEd. (2014, January 23). The 2014 Inside Higher Ed survey of college and university chief academic officers. *Inside Higher Ed*. Retrieved from <https://www.insidehighered.com/news/survey/pressure-provosts-2014-survey-chief-academic-officers>
- Gallup, & Lumina Foundation. (2014). *What America needs to know about higher education redesign*. Retrieved from <http://www.gallup.com/services/176759/america-needs-know-higher-education-redesign.aspx>
- Hart Research Associates. (2015). *Falling short? College learning and career success: Selected findings from online surveys of employers and college students on behalf of the Association of American Colleges and Universities*. Retrieved from <http://www.aacu.org/leap/public-opinion-research/2015-survey-results>

- Jones, B. (2017). Building personal brands with digital storytelling ePortfolios. *International Journal of ePortfolio*, 7(1), 67-91. Retrieved from <http://www.theijep.com/pdf/IJEP237.pdf>
- Kuh, G. D. (1995). The other curriculum: Out-of-class experiences associated with student learning and personal development. *Journal of Higher Education*, 66(2), 123-155. doi:10.1080/00221546.1995.11774770
- Kuh, G. D. (2006). Thinking DEEPlly about academic advising and student engagement. *Academic Advising Today*, 36(2). Retrieved from <http://www.nacada.ksu.edu/Resources/Academic-Advising-Today/View-Articles/Thinking-DEEPlly-about-Academic-Advising-and-Student-Engagement.aspx>
- Kuh, G. D. (2008). *High-impact educational practices: What they are, who has access to them, and why they matter*. Washington, DC: Association of American Colleges and Universities.
- Kuh, G. D. (2017). Forward: And now there are 11. In B. Eynon & L. Gambino (Eds.), *High-impact ePortfolio practice: A catalyst for student, faculty, and institutional learning*. Sterling, VA: Association of American Colleges & Universities and Stylus.
- Kuh, G. D., Ikenberry, S. O., Jankowski, N. A., Cain, T. R., Ewell, P. T., Hutchings, P., & Kinzie, J. (2015). *Using evidence of student learning to improve higher education*. San Francisco, CA: Jossey-Bass.
- Lahey, J. (2017, January 4). How design thinking became a buzzword at school. *The Atlantic*. Retrieved from <https://www.theatlantic.com/education/archive/2017/01/howdesign-thinking-became-a-buzzword-at-school/512150/>
- Leahy, R. L., & Filiatrault, A. (2017). Employers' perceptions of the benefits of employment electronic portfolios. *International Journal of ePortfolio*, 7(2), 217-223. Retrieved from <http://www.theijep.com/pdf/IJEP271.pdf>
- Manhattanville College. (1973) *The Manhattanville plan: A report to the National Endowment for the Humanities*. New York, NY: Author. Retrieved from http://annex.mville.edu/images/stories/Undergraduate_Academics/Library/Special_Collections/The_Manhattanville_Plan_1973.pdf
- Manhattanville College. (2016). *Manhattanville strategic plan 2017-2020*. Retrieved from <https://www.mville.edu/about-manhattanville/office-president/strategic-plan>
- Muckell, M. (2017). *Most noteworthy accomplishments: Michaela Muckell's professional e-portfolio*. Retrieved from https://mville.digication.com/michaela_muckells_professional_eportfolio/Creation_of_a_Professional_e-Portfolio
- National Association of Colleges and Employers (NACE). (2014). *Career readiness competencies: Employer survey results*. Retrieved from <http://www.nacweb.org/career-readiness/competencies/career-readiness-competencies-employer-survey-results/>
- National Survey of Student Engagement. (2005). *Exploring different dimensions of student engagement: 2005 annual results*. Retrieved from http://nsse.iub.edu/pdf/NSSE2005_annual_report.pdf
- Oddey, A. (1996). *Devising theatre: A practical and theoretical handbook*. London, UK: Routledge.
- Peet, M., Walsh, K., Sober, R., & Rawak, C. S. (2010). Generative knowledge interviewing: A method for knowledge transfer and talent management at the University of Michigan. *International Journal of Educational Advancement*, 10(2), 71-85. doi:10.1057/ijea.2010.10
- Rodgers, C. (2002). Defining reflection: Another look at John Dewey and reflective thinking. *Teachers College Record*, 104(4), 842-866.
- Selingo, J. (2016). *There is life after college*. New York, NY: Harper Collins.
- Sidhu, P., & Calderon V. J. (2014, February 26). Many business leaders doubt U.S. colleges prepare students. *Gallup News*. Retrieved from <http://news.gallup.com/poll/167630/business-leaders-doubt-colleges-prepare-students.aspx>
- Sotto, R. (2000). Technological delivery system. In V. Gordon & W. Habley (Eds.), *Academic advising: A comprehensive handbook* (1st ed., pp. 249-257). San Francisco, CA: Jossey Bass.
- Suskie, L. (2009). *Assessing student learning: A common sense guide*. San Francisco, CA: Jossey-Bass.
- Watson, C. E., Kuh, G. D., Rhodes, T., Light, T. P., & Chen, H. L. (2016). Editorial: ePortfolios—The eleventh high impact practice. *International Journal of ePortfolio*, 6(2), 65-69. Retrieved from <http://www.theijep.com/pdf/IJEP254.pdf>
- Wyckoff, S. C. (1999). The academic advising process in higher education: History, research, and improvement. *Recruitment & Retention in Higher Education*, 13(1), 1-3.

ALISON S. CARSON is a Professor of Psychology at Manhattanville College. She served as the Director of the ePortfolio Initiative at Manhattanville College between 2010 and 2014, while participating in LaGuardia Community College's Making Connections ePortfolio Seminar program, and subsequently the FIPSE-funded Connect to Learning Project and remains a faithful member of our ePortfolio Leadership Team. More recently, she is serving as the Assistant Director to Manhattanville's Atlas Program and teaches the Atlas Pursuit course for seniors.

Alison is also involved in Manhattanville's Design Thinking Initiative. Her research investigates culture change, acculturation, and identity.

GILLIAN GREENHILL HANNUM is Professor of Art History and Director of the Atlas ePortfolio Program at Manhattanville College in Purchase, New York, where she has been on the faculty since 1987. A photo-historian with MA and PhD degrees from The Pennsylvania State University, she has been a member of Manhattanville's ePortfolio Leadership Team since 2010, participating in the FIPSE-funded Connect to Learning grant through LaGuardia Community College and a two-year Mellon Foundation grant around reflective learning. She has presented at AAEEBL international, national, and regional conferences and at AAC&U.

CHRISTINE DEHNE is Dean of the School of Arts and Sciences and Professor of Communication and Media at Manhattanville College. She served as Chair of the Board of Academic Standards from 2014-2017, leading the development of the Atlas Program and serving as its

founding Director. An early adopter of ePortfolio pedagogy on campus, she teaches a Communication and Media capstone course based on the Atlas pedagogy. Another curricular experiment led her to team-teach a course of students working collaboratively using design thinking while building mobile applications. An artist, Christine's current research involves devising immersive Theater for the Very Young.

Acknowledgements

We would like to thank Dr. Kyoko Mona, Joi Sampson, and Wil Tyrrell, SA, for their help in preparing this paper. Thank you also to the two anonymous reviewers whose suggestions improved the clarity of this work. We would also like to acknowledge the financial support of the Andrew W. Mellon Foundation during the development of the Atlas program and preparation of this manuscript. The contents of this article were featured at AAC&U's 9th Annual Forum on Digital Learning and ePortfolios on January 27, 2018 in Washington, DC.

Appendix A
ATLAS ePortfolio rubric

	Unsatisfactory (0-1 pt.)*	Satisfactory (2 pts.)	Good (3 pts.)	Exceptional (4 pts.)
Selection of artifacts	The artifacts and work samples do not relate to the purpose of the ePortfolio.	Some of the artifacts and work samples are related to the purpose of the ePortfolio.	Most of the artifacts and work samples are directly related to the purpose of the ePortfolio.	All artifacts and work samples are clearly and directly related to the purpose of the ePortfolio.
Descriptive text	Only some of the artifacts are accompanied by a caption that clearly explains the importance of the item including title, author, and date.	Most of the artifacts are accompanied by a caption that clearly explains the importance of the item work including title, author, and date.	All artifacts are accompanied by a caption that explains the importance of the item including title, author, and date.	All artifacts are accompanied by a caption that clearly and elegantly explains the importance of the item including title, author, and date.
Reflective commentary	The reflections do not explain growth or include goals for continued learning. The reflections do not illustrate the ability to effectively critique work or provide suggestions for constructive practical alternatives.	Some of the reflections explain growth and include goals for continued learning Some of the reflections illustrate the ability to effectively critique work and provide suggestions for constructive practical alternatives.	Most of the reflections explain growth and include goals for continued learning Most of the reflections illustrate the ability to effectively critique work and provide suggestions for constructive practical alternatives.	All reflections illustrate the ability to effectively critique work and provide suggestions for constructive practical alternatives.
Citations	Images, media or text created by others are not cited with accurate, properly formatted citations.	Most images, media or text created by others are cited with accurate, properly formatted citations.	Most images, media or text created by others are cited with accurate, properly formatted citations, though there may be some copyright issues.	All images, media or text created by others are cited with accurate, properly formatted citations.
Navigation	The navigation links are confusing, and it is difficult to locate artifacts and move to related pages or a different section. Many of the external links do not connect to the appropriate website or file.	The navigation links function adequately, but it is not always clear how to locate an artifact or move to related pages or different section. Most of the pages connect to the navigation menu. Most of the external links connect to the appropriate website or file.	The navigation links generally function well. All of the pages connect to the navigation menu. Most of the external links connect to the appropriate website or file.	The navigation links are intuitive. The various parts of the portfolio are labeled, and clearly organized. All pages connect to the navigation menu, and all external links connect to the appropriate website or file.
Usability & accessibility:	The ePortfolio is difficult to read due	The ePortfolio is sometimes difficult to	The ePortfolio is mostly easy to read.	The ePortfolio is easy to read. Fonts and

Text elements, layout, and color	<p>to inappropriate use of fonts, type size for headings, sub-headings and text and font styles (italic, bold, underline).</p> <p>Inconsistent use of font styles (italic, bold, underline) distracts the reader. Color of background, fonts, and links decrease the readability of the text, are distracting and used inconsistently throughout the ePortfolio.</p>	<p>read due to inappropriate use of fonts and type size for headings, sub-headings, text or long paragraphs.</p> <p>Some use of headings, sub-headings and paragraphs promote easy scanning, though others are somewhat awkward. Color of background, fonts, and links are generally used consistently throughout the ePortfolio, though the choices could be more effective.</p>	<p>Fonts and type size are appropriate to their various applications.</p> <p>In general, use of headings, sub-headings and paragraphs promotes easy scanning. Color of background, fonts, and links generally enhance the read-ability of the text, and are generally used consistently throughout the ePortfolio.</p>	<p>type size vary appropriately for headings, sub-headings and text.</p> <p>Use of headings, sub-headings and paragraphs promotes easy scanning.</p> <p>Color of background, fonts, and links enhance the readability and aesthetic quality, and are used consistently throughout the ePortfolio.</p>
Writing conventions	<p>There are more than 6 errors in grammar, capitalization, punctuation, and spelling requiring major editing and revision.</p>	<p>There are a few errors in grammar, capitalization, punctuation, and spelling. These require minor editing and revision.</p>	<p>There are one or two minor errors in grammar, capitalization, punctuation, and spelling.</p>	<p>There are no errors in grammar, capitalization, punctuation, and spelling.</p>

*A score of 0 indicates an element has not been included.

