This book is dedicated to my father Rich.

Thank you...for everything.
EMPLOYER PERCEPTIONS OF AN ENGINEERING STUDENT’S ELECTRONIC PORTFOLIO

A Dissertation Presented to the
Faculty of the College of Education
University of Houston

In Partial Fulfillment
of the Requirement for the Degree

Doctor of Education

by
Karen M. Weber
December 2016
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Approved by Dissertation Committee:

__________________________
Dr. Melissa Pierson, Chairperson

__________________________
Dr. Cheryl Craig, Committee Member

__________________________
Dr. Bernard Robin, Committee Member

__________________________
Dr. Stuart Long, Committee Member

__________________________
Dr. Robert H. McPherson, Dean
College of Education

December 2016
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Abstract

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. In addition, under- and unemployment rates for college graduates are notable since the 2001 recession. 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 hiring managers, educators should explore ways to meet these demands. Developing career electronic portfolios, or ePortfolios, might address both of these needs. Career ePortfolios are websites that present the highlights of students’ academic and professional work through a more comprehensive medium than a traditional résumé. These websites can be made available to employers and graduate admissions committees to assess students’ preparedness for positions.

The primary purpose of the present study was to learn how those with hiring authority perceive and might utilize student ePortfolios. It is unclear if companies are integrating this tool into their decision-making, and if they are reviewing ePortfolios, how this tool influences their judgments. Many of the studies previously conducted regarding the impact of ePortfolios on employability lacked specifics on how employers would use these websites.
This study evaluated employers’ perceived value of using ePortfolios for the employment process by working from Fowler’s (2012) study on ePortfolios. Fowler interviewed employers from the manufacturing and services sectors to investigate whether ePortfolios were advantageous to their pre-employment screening process. The present study explored some of the questions raised by Fowler, but focused on an entirely separate field—the engineering employment sector. In addition, the present study focused on the potential of using ePortfolios in all stages of the candidate screening and evaluation process.

To address the research questions raised within this qualitative study, hiring managers, human resources directors, and recruiters from the engineering sector reviewed an Engineering Student’s ePortfolio. The participants were interviewed to solicit their feedback on the ePortfolio viewed. The researcher garnered their perceptions of the potential for using ePortfolios within their hiring process.

The researcher analyzed the advantages and disadvantages associated with using an ePortfolio over that of traditional candidate screening and evaluation methods. Those interviewed cited specific strengths of using an ePortfolio as the ability to (1) differentiate a candidate, (2) assess potential fit and future with a company, and (3) encapsulate a candidate’s traditional application materials and online media within one website. The possible drawbacks raised by the participants included a (1) duplication of efforts for the candidate and employer, (2) too much information presented to the employer, and (3) the tool being unsuccessfultly 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.
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Chapter I

Introduction

The Association of American Colleges and Universities (AAC&U) reported that, of 302 employers surveyed, only 25% believe that two-year and four-year colleges are doing a good job in preparing students for the challenges of a global economy (Hart Research Associates, 2010). According to Chegg and Harris Interactive (2013), fewer than two in five hiring managers believe recent college graduates are completely or very prepared for a job in their field. A recent Gallup poll revealed that only “14 percent of Americans—and only 11 percent of business leaders—strongly agree that graduates have the necessary skills and competencies to succeed in the workplace” (Alssid, 2014). Further college graduates entering the workforce are perceived as lacking the necessary critical thinking skills employers are seeking (Flores, Matkin, Burbach, Quinn, & Harding, 2012). A gap exists between the learned skills of college graduates and employers’ needs (Tugend, 2013).

Current under- and unemployment rates for college graduates are notable; the rates have risen since the recession of 2001 (Abel, Deitz, & Su, 2014). Working from data taken from the Current Population Survey conducted by the Bureau of Labor Statistics and the Census Bureau, the Federal Reserve Bank of New York estimates that the underemployment rate among recent college graduates stood at 44% as of 2012 (Weissmann, 2013). 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.
The Problem

If employers want 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 student websites that present the highlights of their academic work and proficiencies that may not be included in a résumé or discussed during an interview (Bonsignore, 2013). These websites can be made available to employers and graduate admissions committees to assess students’ preparedness for positions. These career, presentation, or showcase ePortfolios may consist of information on students’ education, work experiences, and leadership activities. The Huffington Post (2014) cites that 80% of employers surveyed admitted to viewing job seekers’ profiles online before deciding if they will interview them or not (Joyce, 2014). Given the likelihood that students will be searched online during the hiring process, it is prudent for educators to support students in making sound decisions on 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 (Woodley & Sims, 2011).

Significance of Study

It is imperative that university educators and students are cognizant of the skills desired by the business community. Recognizing that the process of developing ePortfolios helps students become aware of the attributes appreciated by potential
employers (Willis & Wilkie, 2009), universities should provide more opportunities for students to sharpen and showcase these skills. Studies that include interviewing members of the workforce are important to educators within higher education as they continue to seek ways to show evidence of how colleges and universities are vital to students’ learning trajectory, and pivotal to students’ preparation for the workforce. It is imperative that educators work with employers to learn how to assist undergraduates in preparing for the 21st century workplace (Bradley, Seidman, & Painchaud, 2012). Through learning more about how ePortfolios are perceived by an external audience, educators can build ePortfolio programs that better showcase the skills students need and employers desire in an ever-changing, competitive global workforce. These employers are seeking to hire individuals who are able to communicate effectively in-person and online, and who think critically and innovatively to affect change (Hart Research Associates, 2013). Employers have demonstrated an interest in ePortfolios and working with universities to help college graduates successfully enter and adapt to the workforce (Hart Research Associates, 2013). The present study sought to learn more about employers’ level of interest in ePortfolios, and the specific aspects of ePortfolios they find most relevant for their hiring needs.

Conducting a qualitative study that provides substantive information on employers’ responses when viewing a student’s ePortfolio could enable faculty members and administrators to make informed decisions on whether or not to implement ePortfolio programs at their home institutions. For institutions that already have ePortfolio programs, this study will provide data that administrators might utilize in reforming their current programs. The findings from this study could aid educators in their efforts to
better prepare students as they transition into the workforce. The data received from the interviews with employers can provide additional insight into what they are seeking from potential job applicants, which could contribute to the field of university career services as well as to the field of ePortfolios.

On a personal level, in my position as an administrator of undergraduate research at a university, I hear directly from employers that it can be challenging to hire students who have the skills needed to be successful in the workplace. I also work with students who are concerned about their future job prospects upon graduation; they are seeking ways to showcase their qualifications to employers and graduate and professional school admissions committees. This project contributes to the field by shedding light on audience perspectives regarding ePortfolios, making it worth the extensive time and effort required of a probing qualitative analysis.

**Purpose**

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 the impact of ePortfolios on employability lack specifics on how employers would use the sites. Hallam and Creagh (2010) found in their study on the Australian ePortfolio Project that there is significant
interest in using ePortfolios as a transition tool for students’ employability. An AAC&U report found that four of five employers interviewed claimed they would find using an ePortfolio in their selection of candidates helpful (Hart Research Associates, 2013). However, in both studies there is no mention of what in particular these employers might like to see included on students’ sites. Some articles speculate on its usefulness in preparing students for life after college, but “there has been little research on the actual as compared to the speculated use” of these tools (Woodley & Sims, 2011, p. 166). This study sought to learn hiring officials’ perceived value of using ePortfolios for the employment process.

**Fowler, 2012**

To address this gap in the literature, Fowler (2012) conducted an extensive study on employers’ responses to ePortfolios. Fowler’s study was twofold: He investigated whether manufacturing and services sector employers found ePortfolios helpful to their hiring process; and he developed ePortfolio templates to be utilized for individuals interested in employment within the manufacturing and nursing disciplines (Fowler, 2012, p.7). Within his study, Fowler (2012) raised questions relating to employers’ perceptions of using ePortfolios for employment. His research questions, and qualitative approach to answering the questions, proved fruitful for his examination. This study explored some of the questions raised by Fowler, but focused on an entirely separate field—the engineering employment sector. In addition, Fowler’s study focused on ePortfolio usage within the pre-screening process for employment. This study examined the potential of using ePortfolios in all stages of the candidate screening and evaluation process—not just the pre-employment screening process.
Research Questions

The following research question and two sub-questions, adapted from Fowler (2012), were intended to provide answers to the issues raised within the statement of the problem.

1. What are the advantages and disadvantages of an ePortfolio over that of traditional candidate employment screening and evaluation methods?
   a) In what ways are ePortfolios potentially of value to employers of engineering students in the assessment of an applicant during the hiring process?
   b) What information do employers of engineering students find useful and expect to find in an ePortfolio?

Definitions

21st century skills—“broad set of knowledge, skills, work habits, and character traits that are believed—by educators, school reformers, college professors, employers, and others—to be critically important to success in today’s world” (Glossary of Education Reform, 2014).

Academic portfolio—“a portfolio created in the context of a school, class, or program. Academic portfolios are usually created for assessment purposes” (Kimball, 2003, p. 165).

Artifacts—any document that is uploaded to an ePortfolio that provides evidence of learning or achievement; may include a writing sample, résumé, transcript, certificate, image, graph, chart, diagram, presentation, audio file, video file, research poster file, etc.

Career ePortfolio—“a specific type of portfolio that 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). **This is the type of ePortfolio that was analyzed within this study.** Professional, career, presentation, and showcase ePortfolios are all intended to solicit the attention of external constituents, such as employers and graduate school admissions committees.

*Competency-based curriculum*—“systems of instruction, assessment, grading, and academic reporting that are based on students demonstrating that they have learned the knowledge and skills they are expected to learn as they progress through their education” (Glossary of Education Reform, 2014).

*Constructivist pedagogy*—Piaget’s theory of constructivism focuses on the notion that cognitive growth derives from the learner constructing knowledge—a concept supported by current educational and assessment strategies (Shephard, 2009).

*Dedoose*—software program for storing, coding, analyzing, and sharing data for research studies.

*ePortfolio*—“multimedia environments that display artifacts and reflections documenting professional growth and competencies” (MacDonald, Liu, Lowell, Tsai, & Lohr, 2004, p. 52).

*Experiential learning*—“implements a constructivist approach so that students interact with the content by asking questions to increase understanding and comprehension and at the same time construct their own knowledge;” can also be referred to as inquiry-based learning and authentic learning (Coffman, 2009, p. 1).

*High-impact practices*—George Kuh’s 11 active learning practices within higher education that often result in heightened student engagement, and increased retention and graduation rates; ePortfolios are the 11th high-impact practice (Moore, 2016).
ICT literacy—information and communication technology literacy skills.

Lamination ePortfolios—term used by Lee Shulman to describe exhibition or self-promotion sites failing to offer any substance on learning, knowledge, and intellect (Shulman, 1998).

LinkedIn—a professional networking social media site with over 400 million members.

Pre-employment screening—“any analysis of an applicant’s skills prior to any form of work for the hiring entity” (Fowler, 2012, p. 13).

Professional portfolio—“a portfolio created in the context of a workplace. Professional portfolios are usually created to show professional development or to aid the author in the job market” (Kimball, 2003, p. 170).

QR code—stands for quick response code; a barcode that users can scan using their smartphones, and the code will direct them to a corresponding website.

Soft skills—personal attributes and character traits, such as interpersonal communication; complement technical skills in the workplace.

Traditional pre-employment screening process—“includes an application, cover letter, resume/vitae [sic], and letters of reference” (Fowler, 2012, p. 13).

Web 2.0—Web 2.0 is a platform for building and presenting innovative technologies, and a space where users are prominent and can connect, post, share, and make new meanings with one another (Cormode & Krishnamurthy, 2008).

Location and Field for Present Study

The present study investigated employers from engineering companies and professionals who hired and recruited engineers within the Houston, Texas area. Houston
is widely regarded as the energy capital of the world, housing more than 5,000 companies within the energy field ("Houston facts and figures," n.d.). This makes Houston a popular destination for those interested in pursuing a career in engineering. By way of example, approximately 5,000 students are currently enrolled at the University in Southeast Texas’ Engineering College; this is the University in which the present study took place.

Conducting an ePortfolio study in Houston, Texas within the field of engineering is helpful to both employers who are hiring engineers, and students who are planning to build an engineering career in the region.

**Researcher’s Experience**

I was in an ideal position to serve as the researcher for this study. I have been a director of undergraduate research at a university for over a decade, serving as an adviser to students on nationally competitive scholarships and undergraduate research projects. Realizing how valuable the reflective process is for students who develop applications for nationally competitive scholarships, I sought to bring this reflective process to a larger population of students. This resulted in launching an ePortfolio program in 2012. The process of developing an ePortfolio is similar to completing a competitive fellowship application because it engages students in a reflective writing practice (Penny Light, Chen, & Ittelson, 2012). As the coordinator of an ePortfolio program for over four years, I had the knowledge base, experience, and interest level to conduct this research study.

**Addressing Potential Threats**

Of course, as the coordinator of an ePortfolio program, I had a desire for the employers interviewed to respond favorably to student ePortfolios. I also sought to improve students’ ePortfolio development process as a result of their feedback.
Nevertheless, I worked to ensure the research design for this qualitative analysis was comprehensive, the potential threats to the validity of the study were addressed, and there was richness to the data presentation and analysis to enable other researchers within the field to work from this investigation.

In an effort to increase the validity of this analysis, Fowler’s (2012) research questions and interview protocol were utilized for the present study. In addition, some of the interview questions for the participants were extrapolated from Hartwick and Mason (2014). As explained in Chapters II and III in more detail, Fowler (2012) and Hartwick and Mason (2014) conducted sound qualitative studies on employers’ perspectives on ePortfolios, and this study drew from their examinations.

As explained in Chapter III, participants were selected through purposeful, criterion-based case selection sampling and snowball sampling. The data coding and analysis were executed by following the guidelines of Corbin and Strauss (2015) and Strauss and Corbin (1990). Through triangulation, I cross-referenced the coding and understanding of the data by adhering to Creswell’s (2003) guidelines for interpreting and analyzing data within qualitative studies. Although it was impossible to abandon subjectivities or biases entirely within this qualitative analysis, the threats to validity were alleviated as much as possible.

**Limitations**

Professionals who hire and recruit engineers in the Houston area reviewed an Engineering Student’s ePortfolio. (Throughout this manuscript, the ePortfolio viewed by participants will be referred to as the Engineering Student’s ePortfolio.) The participants then provided their feedback on the ePortfolio during one-to-one interviews. Due to the
narrow scope of this investigation, limitations existed within the research design. All of the participants were from a similar industry sector. This was a narrow case study pertaining to the field of engineering; the observations and interviews collected are not representative of all individuals within the engineering sector. Also, the employers provided feedback on the Engineering Student’s ePortfolio, but they were not actually considering the student for a position within their company. This exercise of reviewing ePortfolios was outside of their actual hiring practice. These limitations were taken into account when analyzing the findings for the study.

Summary

This was a qualitative study on engineering sector employers’ perceptions of an Engineering Student’s ePortfolio. The next step for this study is defining the various types of ePortfolios—concluding with career ePortfolios that were the focus of this study, addressing 21st century skills for student employability, reviewing institutions that offer ePortfolio programs that hone 21st century skills, and finally exploring the literature on employers’ perspectives on ePortfolios, and demonstrating the need for this investigation. These issues will be discussed in the review of the literature in Chapter II.
Chapter II

Review of Literature

Introduction

The purpose of this study was to conduct a qualitative analysis on employers’ perceptions of how the use of an Engineering Student’s ePortfolio might affect their hiring processes. This literature review is divided into four components. The diagram following the introduction and explanation of the components of the chapter (Figure 1) demonstrates the organizational structure for this literature review.

Components of the Literature Review

The first section of the literature review is entitled Defining ePortfolios. This section provides an overview of the various types and roles of ePortfolios, and identifies why this study focuses on web portfolios rather than print portfolios. Next, there is an explanation of how studies on ePortfolios are situated within the field of education, and adhere to constructivist pedagogy, specifically from the perspectives of Dewey, Eisner, Vygotsky, and Shulman. This section then examines the use of ePortfolios for reflection, lifelong learning, assessment, and student employability. This section concludes with a working definition of career ePortfolios, which is used throughout this manuscript.

The second part is titled Defining 21st Century Skills. The section begins with outlining 21st century skills—the competencies that employers are seeking from individuals entering the workplace. The discussion then shifts to an analysis of how using ePortfolios relates to these skills, particularly in regard to innovation and imagination, critical thinking and problem solving, oral and written communication, and information and communication technology (ICT) literacy. This section concludes with how the
construction of ePortfolios can enable students to practice 21st century skills, and identifies the soft skills needed for professional positions within the engineering sector.

The third section of the literature review is called **Identifying ePortfolio Programs that Develop 21st Century Skills**. The section identifies universities and colleges currently offering or that have offered ePortfolio programs that sharpen 21st century skills. A brief review is conducted on U.S. institutions with programs that highlight innovation and imagination, critical thinking and problem solving, oral and written communication skills, ICT literacy, and career development.

**Analyzing ePortfolio Studies on Employability** is the final section of Chapter II, and the researcher examines the literature available on employers’ perceptions of student ePortfolios. This review includes previous studies conducted in the field, the methodologies used, and these researchers’ findings. There is then an explanation of how this study will contribute to the field by identifying the gap in the literature. It also includes a rationale for why an in-depth qualitative study on engineering hiring managers’ perspectives on student websites is important for the field of ePortfolios relating to student employability.
Figure 1. Diagram of Literature Review for Study.
Defining ePortfolios—Part 1

Agreeing on a universal definition for ePortfolios is challenging given the tool’s various purposes and forms in education. 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).

Nevertheless, it is imperative to establish a working definition of ePortfolios for this study. In short, ePortfolios in higher education (also referred to as electronic portfolios, e-portfolios, educational portfolios, digital portfolios, learning portfolios, advisement portfolios, web-based portfolios, and online portfolios) are a means for students to collect, store, reflect, and present their academic, co-curricular, and professional experiences online. Helen Barrett defined an educational portfolio as containing, “Work that a learner has collected, reflected upon, selected, and presented to show growth and change over time, work that represents an individual’s or an organization’s human capital” (Barrett, 2007, p. 436). 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 ePortfolios. 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 into academic, professional, and/or presentation sites over time. According to Kimball, 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 defines 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 describes 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 process of moving forward—expanding, narrowing, and shaping experiences and reflections—results in a dynamic, fluid learning process. Implementing an ePortfolio program that encompasses several types of ePortfolios is recommended (Eynon, 2009). For instance, Penn State’s ePortfolio program was designed to enhance assessment efforts, student learning, and student employability (DeVries et al., 2006).
Purposes of ePortfolios

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). These objectives often complement one another, but not always. Barrett (2004) cautioned that the different purposes could be at odds with one another. For instance, if a teacher is assigning an ePortfolio for assessment, this might be perceived by the student as drudgery or perfunctory, rather than as a means for reflection. However, if ample time and planning are put into the creation of the ePortfolio, the student’s website can effectively serve multiple purposes. A learning ePortfolio can transition into an employment ePortfolio through shifting the intended audience from a teacher to an employer, and then making the necessary revisions based upon this change. Regardless of the particular type of ePortfolio program, developers should determine their purpose for the program as a first step before going forward (Barrett, 2005).

Web over Print Portfolios

This research study is focused on ePortfolios rather than print portfolios given the present digital age, as well as the digital format’s opportunity for flexibility and convenience for users. The ePortfolio should be more dynamic than simply a digital filing system (Niguidula, 1997). When building an ePortfolio, students have the opportunity to use Web 2.0 tools. As cited in definitions, the term Web 2.0 is both a platform for building and presenting innovative technologies, and a space where users are prominent and can connect, post, share, and make new meanings with one another (Cormode & Krishnamurthy, 2008). Web 2.0 tools include social networking sites, blogs, wikis, video
sharing sites, discussion boards, and web applications. For ePortfolio developers, using Web 2.0 tools can include embedding video and audio files, inserting photos, and using hyperlinks, which can result in creating new knowledge, and making meaningful connections on the web. For instance, text within students’ ePortfolios can evolve from print on a page to concept maps, podcasts, and video files (Yancey, 2009b). A standard résumé can be transformed into an interactive webpage, including hyperlinks and visual representations of achievements. A web-based format is also inexpensive, and preferred by hiring managers (Ward & Moser, 2008). In addition, when students are aware their ePortfolios will be shared with a public audience, they may demonstrate a heightened sense of accountability when creating their sites (Moxley & Meehan, 2007). Possibilities for advances in technology are a reminder that ePortfolios in the future will likely appear and function much differently than those used today (Lane, 2009).

**Electronic Portfolios within Education: Dewey, Eisner, Vygotsky, and Shulman**

The purpose and use of portfolios and ePortfolios is grounded in educational theory, practice, and history. As detailed below, the theories of John Dewey, Elliot Eisner, and Lev Vygotsky are all in accordance with the learning process associated with portfolio and ePortfolio practice. In addition, a culture for portfolio usage within the field of education emerged in the early 1980s as a result of Lee Shulman’s assessment program, a response to *A Nation at Risk* (Lyons, 1998). The contemporary ePortfolio stems from the portfolio that Shulman assisted in creating in the 1980s, and is briefly examined within this section.
John Dewey

Students should have more opportunities to learn and do (Dewey, 1938). Asking students to create an ePortfolio is one way to address this need. Piaget’s theory of cognitive constructivism focuses on the notion that cognitive growth derives from the learner constructing knowledge—a concept supported by current educational and assessment strategies (Shephard, 2009). Using Web 2.0 tools contributes to this active approach to learning that supports constructivist theory (Brown, 2007). Helen Barrett (2011) defines the three stages of ePortfolios as “storage, process, and product” (p. 289). It is students’ progression through each of these three stages that enables them to fully engage in the interconnectedness of knowledge, reflection, and technology that developing an ePortfolio can provide. Through archiving their work, determining which artifacts to share, reflecting on these assignments and experiences, and then sharing their sites, students are developing a digital narrative. The reflection process enables students to find meaning in their work and an understanding of their learning; they are constructing and sharing their story (Barrett, 2011).

Elliot Eisner

Elliot Eisner argued that an aim of education is to encourage learners from all disciplines to have new ideas and be imaginative, and at the same time, perform work that is balanced and well executed (Eisner, 2004). He was a strong advocate for the arts within education because in fosters flexibility in thought and practice. The process of designing ePortfolios is in accordance with Eisner’s vision for education. Students reap the benefits from working with a medium that encourages self-expression and
individualism. It also requires employing sound judgment in choosing which aspects of their experiences to share with their audience.

**Lev Vygotsky**

Building and presenting an ePortfolio also adheres to theory in cultural-historical psychology. Lev Vygotsky argued that to understand the ways in which humans think, one must examine the cultural signs and symbols that surround a population. “Although the labor of men and women to improve their world is rooted in the material conditions of their era, it is also affected by their capacity to learn from the past, to imagine, and to plan for the future” (Vygotsky, 1978, p. 129). It is through signs and symbols, and the ability to reflect upon past experiences and consider what lies ahead that makes us human. Examples of Vygotskian signs include writings, drawings, and diagrams (Vygotsky, 1978). Signs within an ePortfolio are the text, images, and other artifacts within the student’s website. Modern 21st century learners communicate through Web 2.0 tools; these are their signs to create and share meaning. These Web 2.0 tools are significantly changing the way in which individuals communicate, socialize, and learn (Thomas & Sheth, 2011).

**Lee Shulman**

Within the field of education, portfolio use grew out of a response to *A Nation at Risk* (Lyons, 1998). This report, authored by President Ronald Reagan's National Commission on Excellence in Education in 1983, claimed the American school system must be reformed to remain competitive internationally. The authors of the report argued that American students’ academic performances were mediocre, the educational standards were not rigorous, and the expectations were not high enough. The open letter
to Americans called for immediate educational reform, particularly in regard to increasing educational standards and enhancing transparency in teacher and student performance and practice (U.S. National Commission on Excellence in Education, 1983).

In response to this document, the report *A Nation Prepared: Teachers for the 21st Century* was drafted. This resulted in the creation of the National Board for Professional Teaching Standards (NBPTS), which was tasked with defining “What Teachers Should Know and Be Able to Do,” and then developing a means to assess these standards (Lyons, 1998, p. 14). The NBPTS called for assessing the teaching profession in an unprecedented, large scale way.

Lee Shulman, from Stanford University, was called upon to lead this assessment initiative. He and his colleagues formulated the Teacher Assessment Project (TAP), and were charged with developing a means to assess faculty within the teaching profession in a novel fashion. He and his team members sought a way for teachers to document their practice and what they were doing in the classroom in a manner that paralleled the depth of the teaching field. As a result, the TAP project introduced the teaching portfolio into the profession. As a pioneer within the field, Shulman paved the way for what is now known as the learning portfolio, or ePortfolio, for students across the country.

**Electronic Portfolios for Reflection**

At the core of all ePortfolio development is the opportunity for students to reflect upon their education (Shulman, 1998). First students collect the artifacts they wish to include in their ePortfolios, and through the process of collection and then reflection, engage in self-assessment (Barrett, 2011). Dewey (1910) defined reflective thought as an “active and persistent” endeavor (p. 6); this activity is congruous with the practice of
developing a student’s ePortfolio. When students are actively and persistently building their ePortfolios, reflection does not occur through happenstance, but instead becomes a purposeful activity. Penny Light, Chen, and Ittelson (2012) stress the importance in students not only understanding what they know, but also recognizing how they know it, and being aware of what they need to learn next as a way of developing a plan for learning. To assist students in planning a strategy for their education, the ePortfolio can serve as a roadmap for students. They can use this tool to view where they have been, and what they have experienced along their journey. They can identify where they are, and if they are satisfied with this current location. They should then look where their path is leading, and ask themselves if they are pleased with the direction of the course, or if they should consider exploring another route (Figure 2).

Figure 2. Roadmap for reflection. This illustration depicts the reflection process that occurs when students create an ePortfolio.
Much of what is currently taught to students is static or already created, which results in students being deprived of circumstances to question the components of a concept, or ponder how the model or theory might evolve going forward (Dewey, 1938). Developing an ePortfolio has the potential to engage students since it asks students to examine various aspects of their education in efforts to create a cohesive website (Drury, 2006, p. 4). Finally, this “folio thinking” process is effective for student learning (Penny Light, Chen, & Ittelison, 2012, p.10); developing an ePortfolio has led to gains in student engagement, course success rates, and retention (Eynon, 2009). In addition, ePortfolios are considered one of George Kuh’s 11 High-Impact Practices (Moore, 2016). These are active learning practices within higher education that often result in heightened student engagement, and increased retention and graduation rates.

**Electronic Portfolios for Lifelong Learning and Use**

The ePortfolio reflective process can foster lifelong learning. For instance, when reflecting upon a recent service experience, students may consider what they have learned while working for a local nonprofit organization. By taking time to explore what they have gained from the service activity, students may feel compelled to participate with the organization again, as well as learn to appreciate the art of reflecting and journaling about their experiences going forward.

Chen (2009) advocated for the importance of 21st century professionals to provide evidence of their lifelong learning skills. She argued that with people now living longer, and working multiple jobs throughout their professional careers, providing evidence of learning over time becomes increasingly more valuable. Job seekers should place less emphasis on a traditional terminal degree, and instead be more cognizant of
demonstrating their competencies and skills learned from their various professional positions (Chen, 2009).

To encourage lifelong learning, offering an ePortfolio program that relies upon an open online source, rather than using ePortfolio software purchased by a university, is recommended. This results in the site belonging to the student, and enhances the likelihood the tool will be used for job searches and when applying to graduate or professional school. Students using university sites may not feel complete ownership over their ePortfolios, as they might with their own social media sites (Garrett, 2011). Also, if a student is designing his or her own original site, rather than working with a template provided by the institution, the ePortfolio program is more likely to be successful (Yancey, 2009a).

**Electronic Portfolios for Assessment**

Assessing programs and projects is the way in which ePortfolios are most commonly used (Cambridge, 2012). There has been a rise in the use of ePortfolios for assessment within higher education as a result of the importance placed upon competency-based curricula (Ward & Moser, 2008). Developing an ePortfolio is instrumental for assessment since it is an evidence-based learning practice (Yancey, 2009a). In this context, students’ ePortfolios are commonly used to assess writing and technical communication abilities (D’Angelo & Maid, 2013). Students’ ePortfolios are quite useful for these purposes since the wide assortment of artifacts available to educators can provide detailed information that traditional forms of assessment cannot offer. Online instruments, such as ePortfolios, can be used to better understand students’ learning and how they receive information, allowing for educators to effectively
customize their curriculum and programs for students (Mills, Knezek, & Khaddage, 2014).

**How to Assess ePortfolios**

Providing consistent and constructive feedback to students is essential when employing ePortfolios for assessment (Zubizarreta, 2009, p.40). An ePortfolio can be a valuable assessment tool for institutions within higher education, but careful consideration must be made when developing and implementing the program. “Combining the students’ reflections with outcomes-based assessment tied to multiple samples of student writing from different course levels” is ideal for students, and a way for the institution to get the data and feedback they are seeking on students’ work and progress (Whithaus, 2013, p. 218). The student’s data should be assessed via a detailed rubric that includes scorings tied to programmatic and learning goals and objectives. An even more refined assessment tool is a digital matrix, which includes ratings and feedback on learning outcomes, course competencies, and student artifacts that show evidence of learning (Meek, Runshe, Young, Embree, & Riner, 2015). This exercise in visual mapping enables educators to identify areas of strength and weakness, and they can then make purposeful modifications to programming. A digital matrix for assessing ePortfolios can also be developed and shared collaboratively among faculty.

Students’ level of engagement is also important when implementing an ePortfolio program. Programs that are successful in engaging students in the development of their ePortfolios receive better scores on key educational measures (Yancey, 2009a). If institutions plan to use ePortfolios for assessment, instructors must communicate to students how this tool will benefit them (Penny Light, Chen, & Ittelson, 2012). If
students’ needs are not considered, the pupil may find the task of collecting and reflecting laborious, and the reliability of the assessment tool may be questionable.

**Electronic Portfolios for Employability**

It is valuable for students to use their ePortfolios while searching for employment (Drury, 2006). These types of ePortfolios can be referred to as professional portfolios, which Kimball (2003) defines as portfolios developed with the perspective of the workplace. Barrett (2011) refers to ePortfolios that are intended for product rather than process as presentation or showcase ePortfolios. For the present study, these types of ePortfolios are called **career ePortfolios**.

**Career ePortfolios**

Career ePortfolios are intended to promote the highlights of a student’s educational career when seeking employment (Bonsignore, 2013). Students can use their sites as an additional tool or resource for their job search, or to demonstrate their growth within their existing professional positions (Kimball, 2003). Recognizing that rather than focusing on disciplinary knowledge, hiring managers are more concerned with skills such as communication, imagination, productivity, and attributes appropriate for the specific field (Shephard, 2009), students can take advantage of the employability benefits associated with building an ePortfolio by demonstrating these qualities on their sites. It behooves students to showcase skills that directly relate to their career objectives (Bonsignore, 2013). They can be purposeful when presenting their online sites by including information they believe will be relevant to their audience. Career ePortfolios can exhibit students’ competencies for those making hiring decisions (Yancey, 2001).
However, students and educators should be wary of producing _lamination_ ePortfolios, which are exhibition or self-promotion sites failing to offer any substance on learning, knowledge, and intellect (Shulman, 1998). Even if the student’s ePortfolio is intended for an external audience, if the reflection element is absent, an integral part of the learning process and the final product is missing. Students’ reflections and insights should inform the content of the ePortfolio. Although the primary role of this student employability genre of ePortfolios is to present students’ best work, these types of ePortfolios can also be used for assessment by institutions of higher education and professional accreditation agencies (Bonsignore, 2013).

**Network and Symphonic Self in Career ePortfolios**

Darren Cambridge (2008) argued that the role for students who are developing career ePortfolios must be twofold: to create a tool students can utilize in their job search (the network self), and to develop a digital identity that enables students to find meaning and a voice within their professional online spheres and the greater society (the symphonic self). Cambridge explained it would be a detriment to students’ learning to build an ePortfolio solely for the purposes of appealing to a particular employer or sector. By creating ePortfolios based only upon what students envision their audience would like to know, they are serving as a commodity of sorts for an employer—presenting themselves as the types of individuals they believe hiring managers are seeking. Instead, while developing their ePortfolios and making meaning of their academic and professional experiences, they should come to recognize the role they might play in positively affecting the workplace as a social agent. Although career ePortfolios are effective for presentation and showcase purposes, it is integral to students’ intellectual
and educational development that the demonstration of their identity, goals, and objectives are genuinely meaningful and authentic self-assessments (Cambridge, 2008).

**Electronic Portfolios for the Present Study**

In this present study, ePortfolios are generally defined as “multimedia environments that display artifacts and reflections documenting professional growth and competencies” (MacDonald et al., 2004, p. 52). This research project focused primarily on career ePortfolios. Career ePortfolios are defined as a “specific type of portfolio that 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). These ePortfolios are created with the intention to enhance students’ candidacy for competitiveness when entering the workforce.

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. 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). This study seeks to address this gap in the literature of how audiences or external constituents respond to student ePortfolios, and how their feedback might better inform students who are developing ePortfolios. Since ePortfolios are a means for students to communicate their experiences and ideas with an online audience, in many cases academic and professional
communities, more should be known on how the outside world might perceive their sites.

The findings from this project intended to shed light on employers’ perspectives when viewing student ePortfolios.
Defining 21st Century Skills—Part 2

In exploring employers’ perspectives on student ePortfolios, it is critical to investigate what hiring managers are seeking from students and individuals entering the workforce. The Business-Higher Education Forum (2003), comprising leaders in higher education and of corporations from across the nation, stated a “skills gap” currently exists within the American workforce; there is a gap between what individuals are trained to perform and what the current needs are within the job market (p. 9). In efforts to address this gap, career-focused competencies are often recommended. These competencies are commonly referred to as 21st century skills (Greenstein, 2012; Marzano & Heflebower, 2012; Saavedra & Opfer, 2012). The Great Schools Partnership, a nonprofit organization of educators and school leaders working to reform public education, defined 21st century skills in their Glossary of Education Reform (2014) as:

A broad set of knowledge, skills, work habits, and character traits that are believed—by educators, school reformers, college professors, employers, and others—to be critically important to success in today’s world, particularly in collegiate programs and contemporary careers and workplaces. Generally speaking, 21st century skills can be applied in all academic subject areas, and in all educational, career, and civic settings throughout a student’s life.

The Glossary of Education Reform (2014) then went further in listing 13 specific 21st century skills traits. Eight of the 13 competencies included research skills, perseverance, and civic, financial, global, scientific, environmental, and health literacy. The other five attributes directly related to skills developed through portfolio building:

2. Creativity, artistry, curiosity, imagination, innovation, personal expression.

3. Oral and written communication, public speaking and presenting, listening.

4. Leadership, teamwork, collaboration, cooperation, virtual workspaces.

5. Information and communication technology (ICT) literacy, media and Internet literacy, visual interpretation, data interpretation and analysis, computer programming.

When defining 21st century skills, the Center for 21st Century Skills at EDUCATION CONNECTION (n.d.) listed six central criteria:

1. Information literacy.

2. Collaboration.

3. Communication.

4. Creativity and innovation.

5. Problem solving.

6. Responsible citizenship.

The Partnership for 21st Century Skills (2010) included four central areas for student outcomes in their definition: life and career skills, learning and innovation skills, information media and technology skills, and core subjects (Figure 3).
There are variations in defining 21st century skills among educational reformers and organizational representatives. Nevertheless, there is a consensus regarding what qualities college graduates need to demonstrate upon entering the workforce. These skills include, but are not limited to: innovation and imagination, critical thinking and problem solving, oral and written communication, and ICT literacy.

**Addressing 21st Century Skills through ePortfolios**

If employers are seeking 21st century skills, collegiate students should have opportunities to develop these proficiencies. Using ePortfolios is recommended to hone these attributes. Students’ ePortfolios showcase their knowledge of 21st century skills, such as thinking analytically and imaginatively, and building an ePortfolio is an ideal
means for students to recognize their educational accomplishments (Greenstein, 2012; Malita & Martin, 2010). Under President Barack Obama’s administration, the U.S. Department of Education’s Office of Educational Technology (2010) released guidelines in which the use of ePortfolios is encouraged. They cite the value of portfolios as encouraging learners to take ownership of their education through managing their own educational record; students can evaluate their academics by taking inventory of their strengths and weaknesses. The usage of digital portfolios is a hallmark component for a 21st century school (Bassett, 2005), and develops innovation and imagination, critical thinking and problem solving, oral and written communication, and ICT literacy skills.

**Innovation and Imagination**

The basic shell of an ePortfolio can be constructed using a wide range of software programs available (Lane, 2009), which means students have flexibility in choosing how to build their sites. The mechanics of building a digital identity—developing webpages, embedding files, adding hyperlinks, and editing photos—encourages students to use their imagination in creating original work. Electronic portfolios are dynamic in that they can continually evolve and adapt with the learner or site creator (Greenstein, 2012).

**Critical Thinking and Problem Solving**

The Business-Higher Education Forum (2003) advocates for students using interactive learning tools to encourage learning through doing, recognizing they are not going to develop these skills through passively using technology, such as watching a movie on their phone. Educating students effectively includes engaging them in experiential learning, inquiry-based learning, or authentic learning (Coffman, 2009; Littleton, Scanlon, & Sharples, 2012; Roberts, 2012). Reflection is at the core of inquiry-
based endeavors (Coffman, 2009), and is the driving force behind ePortfolios as stated in Part 1 of this chapter. By reflecting on their education, and drawing meaningful connections within their experiences, students use metacognitive strategies in their thought process (O’Brien, 2006), hence employing critical thinking skills.

**Oral and Written Communication and ICT Literacy**

Developing ePortfolios has shown to improve students’ writing abilities (Acker & Halasek, 2008). Given that “more than one-quarter of four-year college graduates are perceived to be deficiently prepared in written communications,” using ePortfolios could be a way to sharpen these skills (Conference Board, Inc., 2006, p. 7). Also, when building career ePortfolios, students may use some of the material from their sites as talking points in a job interview. This can aid in how they orally present their activities and achievements. In addition, ePortfolios can be used as an opportunity to share with an external online community, hence building networks that will contribute to social capital (Acotsta & Liu, 2006). It is vital students know how to effectively use electronic devices and social media to generate new information, hence prospering within a knowledge economy (P21, 2010).

The more students engage with technology as a means to connect and engage others, the more opportunities they will have to develop their information and communication technology (ICT) literacy. ICT or digital literacy plays an important role in professional, intellectual, and social development (Kuo, Tseng, Lin, & Tang, 2013). Given the overabundance of technologies and online profiles available, it behooves students to build their own personal digital identity, which best represents their abilities and skillsets (Malita & Martin, 2010). Using ePortfolios can be a means for students to
introduce themselves to their online audience, and can become a tool for communicating and engaging with peers and professionals (Barrett, 2011).

**Electronic Portfolios Hone 21st Century Skills**

Therefore ePortfolio programs offer a means for students to develop the talents a globally competitive workforce is seeking from graduates. Hallam and Creagh (2010) wrote that their Australian ePortfolio Project heightened awareness of ePortfolios within higher education as a tool, and also increased interest in its potential for learning both on campus and within the external community. This presents an opportunity for educators and employers to work together to learn how ePortfolios might convey the attributes employers are seeking (Hallam & Creagh, 2010).

**Adjusting to the Job Culture through ePortfolios**

Encouraging college students to develop an ePortfolio may also better prepare them mentally for entering the 21st century workforce. The adjustment from college life to professional life can be challenging for students. The college culture is more flexible, and performance expectations for students are typically clearly defined, whereas the job culture is more rigid and expectations can be vague (Reardon, Lenz, Sampson, & Peterson, 2000). By building an ePortfolio, students are beginning to intellectually transition themselves from student to employee, contemplating their identity as a member of the workforce. In addition, it is recommended for students when embarking on a job search to first determine their goals and objectives (Reardon et al., 2000). Building an ePortfolio is an ideal tool for students to utilize when contemplating what they have accomplished, as well as what they hope their future will entail.
Soft Skills Needed within the Engineering Sector

The participants for this qualitative study were those who recruit and hire engineers, so it was necessary to learn more about what individuals within this sector are seeking. In engineering, the ability to communicate effectively to a particular audience is crucial (Chou, 2013). Engineers are expected to successfully interact with their colleagues, staff, and managers throughout their companies, as well as with members of the community outside their firms (Russell, 2003). Tully (2012) emphasized the importance for engineers to be proficient at what are commonly referred to as soft skills, such as the ability to effectively communicate and collaborate. Engineers are often confronted with complex issues, and when working through these matters, it is necessary they have the ability to successfully convey their ideas so that all the stakeholders involved in the project understand their plans (Tully, 2012). Creativity is also an important skill for engineers, and has emerged as a new capital within the field (Butcher, 2013). Given that the critical proficiencies in engineering include communication, team, interpersonal, and critical thinking skills (Yaacoub, Husseini, & Choueiki, 2011, p. 97), the employability skills needed in the engineering sector are comparable to the 21st century skills needed in many other fields across the United States.
Identifying ePortfolio Programs that Develop 21st Century Skills—Part 3

Part 3 of this literature review examines a subset of the many ePortfolio programs within higher education that support 21st century skills. Since innovation and imagination, critical thinking and problem solving, oral and written communication skills, and ICT literacy are attributes employers are seeking, and these are skills that can be sharpened through portfolio development, it is necessary to review some of the ePortfolio programs in the U.S. that enhance these skills. In addition, this study focuses on ePortfolios for employment, so this section concludes with a brief analysis on programs within higher education that promote portfolio usage for career development.

Innovation and Imagination

An acclaimed ePortfolio initiative in the U.S. is offered through the LaGuardia Community College of the City University of New York (CUNY). For over a decade, LaGuardia Community College has housed a comprehensive, successful ePortfolio initiative, which has served thousands of students (“Milestones,” n.d.). LaGuardia students collect, select, and reflect on their body of academic and creative work, and then connect their work with the external community by sharing their educational and professional aspirations (Benitez & DeAro, 2004). The LaGuardia program paved the way for other campuses to espouse innovative ePortfolio programs through promoting portfolio usage within multiple environments—a learning space, a reflective space, and a career space—and for many purposes. Medgar Evers College (MEC), another CUNY institution, has an ePortfolio program designed to heighten engagement for at-risk students through cultivating a culture for reflective learning (Diaz, Saran, & Zummo, 2011). As evidenced through the examples of ePortfolios online, the Medgar Evers
program encourages students to incorporate personal reflections, educational artifacts, and professional competencies all within a single site, recognizing the numerous purposes an ePortfolio can serve.

**Critical Thinking and Problem Solving**

Alverno College in Milwaukee, Wisconsin offers an ePortfolio program that measures eight proficiencies, three of which include communication, problem solving, and developing a global perspective (Lorenzo & Ittelson, 2005). Arizona’s Maricopa County Community College District participates in the College and Career Transitions Initiative project, a teacher preparation program. Educators from high schools, community colleges and universities in Arizona participate in the project’s ePortfolio program (National Center for Teacher Education, n.d.), hence creating avenues for participants to collaborate and problem solve. San Francisco State University has coordinated ePortfolio initiatives since 2005 that support 21st century skills (Shada, Kelly, Cox, & Malik, 2011). For instance, when implementing Metro Academies, a two-year learning program for first-generation, low-income, or underrepresented students, and a partnership with the City College of San Francisco, four implementation goals included “critical thinking, oral communication, English, and quantitative reasoning” (p. 73).

**Oral and Written Communication Skills**

Auburn University’s Quality Enhancement Plan for 2012-2018 entailed launching an ePortfolio program for students. The program is housed within the Office of University Writing, and “effective communication” is the first item within their listing of learning objectives (Auburn, 2010). Auburn’s ePortfolio project guides students through the process of improving their writing within their particular field. The University of
Notre Dame offers a first-year advising ePortfolio to students (University of Notre Dame, n.d.). The program provides students with prompts on how they might strengthen their oral and written communication skills, and they are encouraged to include their responses within their ePortfolios. These questions are for first-year students to reflect upon, and then take action to refine their communication abilities. Salt Lake Community College lists effective communication as a primary educational goal of their ePortfolio program (Salt Lake Community College, n.d.). They define communication skills broadly, including the ability to write and speak effectively, to understand and navigate the social dynamics of small and large groups, and to communicate through technology and library resources.

**ICT Literacy**

Guttman Community College, another CUNY institution, requires students to develop an ePortfolio during their first year (Weinbaum, Rodríguez, & Bauer-Maglin, 2012). Guttman ePortfolio students hone their information and communication technology (ICT) literacy skills by working directly with faculty and library staff members on how to effectively access and use information. Hartwick College’s Nursing Department, located in Oneonta, New York, launched an ePortfolio program in efforts to enhance students’ technological skills and develop a medium for them to showcase their experiences to external constituents (Jenkins, 2001, p.71). In 2008, the University of Michigan launched the Mportfolio Project to integrate pedagogy and technology to assist students in sharing and communicating their learning experiences during their academic career (Peet et al., 2011). The program coordinators are committed to providing a
program that develops ICT literacy for student development (“What is MPortfolio?”
n.d.).

**Career Development through ePortfolios**

Florida State University’s (FSU) Career Portfolio program, launched in 2002, has been effective in supporting students’ career explorations, and their transition into the workforce and graduate and professional school (Lumsden, 2007). At FSU, their ePortfolio program encourages students to link their learning, educational, and co-curricular achievements and activities with skills employers are seeking (Penny Light, Chen, & Ittelson, 2012). This is an initiative offered through FSU’s The Career Center, and their portal offers a means for visitors to review students’ ePortfolios via access key (“View FSU Student Portfolio,” n.d.). Since 2006, Clemson University has offered an ePortfolio program for all undergraduates. Clemson’s program assists students in considering the real world applicability of their coursework, and helps them connect their university experiences with their professional aspirations (Ring & Ramirez, 2012).

Seattle Pacific University offers a blog portfolio, or bportfolio, program to students in the School of Education (“SPU Teacher Education,” n.d.). The bportfolio is similar to an ePortfolio in that students post evidence of their professional knowledge and skills as identified in the standards of the program.

Perhaps the most groundbreaking development within the higher education ePortfolio landscape is a recent collaboration involving 80 colleges across the country. These institutions have formed a coalition to address their concerns with the accessibility of the Common Application for low-income high school students attempting to apply for college (Jaschik, 2015). They are working together to develop an ePortfolio for students
beginning as early as the ninth grade. The list of affiliates includes institutions, such as Harvard, Yale, Stanford, Texas A&M, Northwestern, and Ohio State, just to name a few.

The most robust ePortfolio initiative within the country is eFolioMinnesota, the first statewide ePortfolio program within the United States. The software can be used by students of all ages, as well as job seekers. Although it began as a free resource, there is now an annual fee to use the platform. The program represents the ability of an ePortfolio program to be utilized by diverse populations for professional, intellectual, and personal reflection and presentation. It is evidence of Chen’s (2009) lifelong and life-wide ePortfolio model by presenting an opportunity for individuals to showcase their vast array of experiences in a way that is flexible and portable (eFolioMinnesota, 2015).
Analyzing ePortfolio Studies on Employability—Part 4

Thus far this review of the literature has examined the various types and roles of ePortfolios, concluding with a working definition of career ePortfolios for this study. Then the researcher defined 21st century skills, how these proficiencies complement ePortfolio use, and analyzed colleges and universities offering ePortfolio programs that support 21st century skills (Figure 4).

![Diagram](https://via.placeholder.com/150)

*Figure 4.* Figure depicting four parts of literature review for present study.

It is now necessary in this final section of the literature review, Analyzing ePortfolio Studies on Employability, to investigate similar studies in the field, situate the study within the current literature, and demonstrate the need for the present study. Part 4 of this literature review examines other studies that have been conducted pertaining to employers’ reactions to and feedback on student ePortfolios.
Australian ePortfolio Project

Perhaps the most extensive work in this field was produced by the team members of the Australian ePortfolio Project, a program funded by the Australian Learning and Teaching Council, an initiative of the Australian Government Department of Education, Employment and Workplace Relations (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. Their first report on the project (Hallam et al., 2008) was a comprehensive depiction on the way in which Australian institutions of higher education use ePortfolios. To follow-up on this initial 2008 report, Hallam and Creagh (2010) then surveyed participants, held focus groups, and conducted interviews with the educational stakeholders at four Australian institutions: Queensland University of Technology, The University of Melbourne, University of New England, and University of Wollongong. The research “revealed that a significant number of people was interested in the use of ePortfolios in learning, in transition into employment and in career development” (Hallam & Creagh, 2010, p. 190).

Career ePortfolios within the Workforce

Although there is an interest in using this tool for employment, the specifics on how those making hiring decisions might garner a holistic depiction of candidates through using ePortfolios within their employment process is unclear (Woodley & Sims, 2011). Nevertheless, it seems if 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. These managers appreciated the ability to assess candidates’ writing and communication abilities as well as their demonstration of critical thinking skills. 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. It could be used as a source when pooling talent for job searches. The researchers acknowledged, however, that this would be an ambitious undertaking given the multiple steps needed for implementation.

Ward and Moser (2008) took their study a bit further by surveying 5310 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. Their study found it was advisable to include résumés, artifacts of writing, presentations, and projects, and references in ePortfolios for prospective employers to view (p. 14).

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. How they might use the resource varied per industry, but overall, certificates, professional experiences, reflections, co-curricular activities, and video introductions were aspects of the websites the managers enjoyed viewing.
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. Within the literature, 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, p. 174). Some of Hartwick and Mason’s interview questions were utilized for the present study (see Appendix A).

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. They found that time was a 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 interview with "four principals or vice-principals, a representative of the Department of Education and Training, and three representatives from the Australian Council for Health, Physical Education, and Recreation" (p. 7). These 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 Wetzel (2005) who conducted a similar ePortfolio study on the hiring process for teachers.

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” (p. 67). Lack of time to review portfolios came up again as the most significant limitation. Other concerns included presenting a poorly executed portfolio would reflect negatively on the applicant, showing the portfolio at the interview was an inappropriate time, and assessing a portfolio was a difficult undertaking.

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. The career services representatives answered questions about their experience with portfolios, and the role of portfolios within the hiring process. Boody concluded that although employers are open to viewing portfolios when presented, there is not a specific process in place for viewing them. As Boody’s study indicates, there are varied impressions of the utility of ePortfolios across disciplines. Many hiring managers are amenable to using portfolios, but it is not an identified step within their existing process. There are also concerns regarding the use of the tool, such as the time it takes to review a portfolio and how to adequately assess them.
Fowler’s Doctoral Study

As referenced in Chapter I, Fowler’s (2012) doctoral, qualitative study involved interviewing 12 employers from the service and manufacturing sectors to secure their feedback on ePortfolios (p. 69). 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 (p. 201).

Need for Study

Given that there are diverse perspectives on the use of ePortfolios for the hiring process, additional studies need to be conducted within this field to learn how engineering hiring managers will perceive the tool. This present study drew from Fowler’s (2012) research questions, reference materials, methodology, and findings. His transcript verification form was also utilized for the participants in the present study, and some of his citations were included within this review of the literature (Brammer, 2007; Christmann & Dahn, 2006; Creswell, 2003). In addition, many of Fowler’s (2012) interview questions were used when interviewing employers for this study since his inquiries proved successful in extrapolating the information he was seeking from hiring bodies in the manufacturing and service sector. As mentioned earlier, this research project also worked from Hartwick and Mason’s (2014) inquiry as well by utilizing some of their interview questions (see Appendix A).
Present Study

This present study expanded Fowler’s (2012) work by garnering feedback from a new sector: the engineering sector. An ePortfolio could be a useful tool for those with hiring responsibilities in engineering, but more information is needed to identify what precisely these representatives might glean from students’ websites. As presented in Chapter I, institutions in higher education need to be more effective in preparing college students for 21st century skills when entering the workforce. In Part 1 of Chapter II, the researcher presented how the use of ePortfolios is effective for student reflection, lifelong learning, assessment, and employability. Part 2 of Chapter II was an explanation of how using ePortfolios is a tool to hone 21st century skills—the same skills the engineering sector is seeking from job applicants. Many institutions across the country are using ePortfolios for this purpose, as described in Part 3 of this chapter. If students can use ePortfolios to sharpen the skills employers are seeking, this may be a tool that is useful for job seekers. However, as Part 4 of Chapter II indicated, it is unclear how employers might utilize ePortfolios within their hiring process, hence paving the way for the present study.

To address this inquiry, the present study consisted of garnering employers’ perceptions about ePortfolios through semi-structured interviews. The city of Houston “has one of the world's greatest concentrations of engineering talent generated from its energy, aerospace and medical clusters” (“Houston’s Economy,” n.d., para. 2). Learning more about how employers within this growth sector might perceive students’ ePortfolios was important information to ascertain. The findings from this study may assist
educators, particularly within the Houston area, in forming and reforming ePortfolio
programs to better meet the needs of the 21st century student and job market.

Next Step

The next step for the study is to provide detailed information on how this
qualitative investigation on employers’ perspectives regarding an Engineering Student’s
ePortfolio will be conducted. In Chapter III, information on the methodology and context
of the study will be shared. This next chapter will begin with an explanation of Fowler’s
(2012) study, and how the present study was an adaptation of Fowler’s inquiry. It will
then include detailed information on the present study’s research context, type of
qualitative analysis, research questions, selection sampling, Engineering Student’s
ePortfolio that was reviewed by participants, interview protocol, data collection and
analysis, confidentiality and data management, role of the researcher, potential threats to
validity, pilot study conducted to assess the research design and interview protocol, use
of pilot study, interview and peer debriefing with subject matter expert, and concludes
with descriptions of the participants for the present study and their companies.
Chapter III

Methodology

This was a qualitative study within the field of career ePortfolios. The researcher explored how employers perceived the utility of an Engineering Student’s ePortfolio for their potential hiring purposes. The investigation involved interviewing engineers, or those with experience in hiring engineers, to garner their feedback regarding the Engineering Student’s ePortfolio.

Introduction

This chapter explains the research methodology and design for this study. It begins with an explanation of Fowler’s (2012) ePortfolio study, and how the present study extended his work by changing two central variables. The section details how the present study targeted engineers with present or past hiring responsibilities, as well as those who hire engineers in the Southeast Texas region. Next, the research context is identified. A rationale is provided for why a qualitative, phenomenological, multiple case study was most appropriate for this examination.

The research questions for this study are then defined. A discussion on selecting the participants through purposeful, criterion-based case selection sampling and snowball sampling is included, as is an explanation on how the subjects were identified and contacted. A description of the Engineering Student’s ePortfolio that was reviewed by the participants is presented. The interview protocol is then outlined, including the pre-interview viewing; location of the interviews; timing, recording, and observing of the interviews; actual interview process; observational data; field notes; and post interview
follow-up. An explanation of the way in which the data was transcribed, analyzed, and managed is presented. The role and background of the researcher is clarified.

Then the validities associated with the research project are addressed, particularly the descriptive and interpretive, theoretical, generalizability, evaluative, face, and external validities are discussed. A description and analysis from the pilot study conducted to assess the research design and interview protocol for this study are explained. Information from the preliminary interview and peer debriefing with the subject matter expert is also presented. The chapter concludes with a presentation of the participants for the study, including demographic information as well as context on their companies.

**Fowler’s Research Study**

The present study builds upon Matthew Fowler’s (2012) doctoral study, which analyzed employers’ perspectives on ePortfolios. Fowler’s study comprised interviewing 12 representatives from the Wabash Valley College Advisory Council—six representatives from the manufacturing technologies program and six from the nursing program. Fowler’s analysis was two-fold. He first addressed whether hiring managers in these two sectors found value in using ePortfolios in the hiring process. He then sought to develop an ePortfolio template for manufacturing and nursing educational programs.

**Wabash Valley College**

Fowler’s (2012) participants were affiliated with Wabash Valley College, which was founded in 1960, and located in Mt. Carmel, Illinois. It is one of four colleges within the Illinois Eastern Community Colleges District, and houses a student population of over
30,000. Wabash Valley College offers two-year degrees, certificate programs, and courses for students pursuing professional and intellectual endeavors.

**Fowler’s Research Questions**

Fowler’s (2012) analysis addressed the overarching research question:

In what ways do interviewers from the manufacturing and service sector use an ePortfolio in the evaluation of candidates for employment, and do those evaluations lend themselves to the development of a template for ePortfolios in career and technical education? (pp. 7-8).

Fowler then divided this grand tour research question into six separate research questions:

1. Are there advantages of an ePortfolio over that of traditional pre-employment screening processes?
2. Does the ePortfolio showcase the skills that a candidate possesses in comparison to the skills required on the job to provide authentication of these necessary skills?
3. Are ePortfolios of value to manufacturing and service sector employers in the assessment of an applicant’s skill level during the hiring process?
4. Are there advantages of an ePortfolio over that of a text-based portfolio?
5. What information do employers of career and technical students find useful and expect in an ePortfolio?
6. Can a template be developed that will be perceived to provide authentication of workplace skills useful to hiring officials in various technical areas?
Fowler’s Findings

Fowler found that ePortfolios containing the right information saved his participants time and money when hiring. His study also found that ePortfolios provided employers with a “greater depth of information, more accurate information, [and] connections amongst the information presented” (Fowler, 2012, p. 201). Some of his findings included employers’ frustrations with the limitations and inaccuracies of a résumé and the expense involved in the hiring process. The representatives from both sectors in Fowler’s study desired individuals who had the skills to perform the job, and who were also the right fit for the organization.

Adapting Fowler’s Study for Present Study

Although the present study built upon Fowler’s (2012) analysis, two main variables were changed from Fowler’s original investigation. Fowler studied the manufacturing and service sectors, and he focused on the potential impact of ePortfolios within the traditional pre-employment screening process. Fowler defined the traditional pre-employment screening process as the initial stage in the hiring process, which includes the application, cover letter, résumé/vitae, and letters of reference (Fowler, 2012, p. 13). For the present study, the field of employment was engineering. In addition, this study examined the potential of using ePortfolios in all stages of the candidate employment screening and evaluation process—not just the pre-employment screening process.

Analyzing Engineering Sector in Houston

To conduct this focused study, the feedback received by participants needed to represent a particular employment sector to draw comparisons and address phenomena;
one industry had to be chosen among all the possible fields. The present study investigated the current hiring practices within the field of engineering, and how an ePortfolio might affect these processes. The researcher learned how Fowler’s (2012) results from the manufacturing and service sectors compared when interviewing employers within a different industry—the engineering sector.

As mentioned in Chapter I, Houston is considered the energy capital of the world, and employs nearly 90,000 professionals within the engineering and architecture fields (“Houston’s top industries,” n.d.). Houston boasts a thriving global economy, and the energy and engineering industries are pivotal to this success. For instance, more than 5,700 Houston-area firms are involved in global commerce, compared to 1,900 just 30 years ago (“The economy at a glance: Houston,” n.d.). For the city to maintain its growth and vitality, it is imperative that energy and engineering companies hire professionals with the appropriate schooling and skills they are seeking. For this reason, it was appropriate to extend Fowler’s (2012) study on the manufacturing and service sectors to the engineering sector in Houston.

**Analyzing all Stages of Hiring Process**

Participants for the present study included engineering hiring managers, as well as human resources professionals who hire engineers. The researcher garnered their insights on the potential of using the tool. Since the examination focused on all stages of the candidate employment screening and evaluation process, it was insightful to solicit feedback from hiring managers, representatives from human resource, and recruiters.
Research Context—University for Present Study

The present study expanded Fowler’s (2012) study to a University in Southeast Texas. This institution is the second most ethnically diverse university within the U.S. (U.S. News & World Report, 2014), and is presently one of only three universities in the nation that is both a Carnegie Top Tier Research University and a designated Hispanic Serving Institution. More than 43,000 students attend this public research institution, and the student body represents over 137 nations from across the globe. There are 15 academic colleges on campus:

- Architecture
- Arts
- Business
- Education
- Engineering
- Honors
- Hotel and Restaurant Management
- Law
- Liberal Arts and Social Sciences
- Natural Sciences and Mathematics
- Nursing
- Optometry
- Pharmacy
- Social Work
- Technology
Qualitative, Phenomenological, Multiple Case Study

A qualitative research approach was necessary for this study in effort to capture employers’ in-depth responses to the interview questions, and for their meanings to be more fully understood. “Phenomenology is a theoretical point of view that advocates the study of direct experience taken at face value” (Cohen, Manion, & Morrison, 2011, p. 18). By employing a phenomenological approach, a methodology first brought to field of social sciences by Edmund Husserl (1954), it became evident how the participants perceived the ePortfolio they viewed. The participants’ feedback was analyzed and compared to identify commonalities and shared perceptions.

More specifically, conducting a multiple case study to explore engineering employers’ perceptions of ePortfolios was the most appropriate means to conduct this investigation. By completing a detailed analysis of how this population responded to ePortfolios, common patterns and themes within the interview responses were identified. The findings did not seek to generalize from a broad-based view, but rather identified common behaviors within the group of the individual cases represented (Hancock & Algozzine, 2011). In addition, Fowler (2012) conducted a qualitative multiple case study, and this approach was successful for his inquiry.

Hancock and Algozzine (2011) stated that case studies typically have three central components: (1) there should be a focus on a group, organization, or phenomenon, (2) the phenomenon studied should be conducted in a natural context, and (3) the study should be richly descriptive. For this study, the focus was on employers’ perceptions of an Engineering Student’s ePortfolio. The phenomenon was understanding and making meaning of the participants’ responses to how using ePortfolios could affect their hiring
practices. Secondly, the context was securing the participants’ input in real time, and accounting for any other circumstances that may have affected their perceptions. Factors such as their professional roles and duties, tenure within their companies, past experiences with hiring, current hiring practices, and prior knowledge of ePortfolios likely affected their responses to the interview questions. Finally, the results from this qualitative study provided thorough descriptions of how the potential use of an ePortfolio during the hiring process was perceived by the participants.

**Research Questions**

This phenomenological research study solicited responses from engineers, and those who hire and recruit engineers, on how they perceived the utility of an ePortfolio for hiring purposes, and whether, and in what ways, this tool would be valuable to them in their hiring process. The research questions for this study were derived and adapted in part from Fowler’s (2012) list of research questions, while at the same time, questions were omitted and modified to directly address the purpose and context of this study.

1. What are the advantages and disadvantages of an ePortfolio over that of traditional candidate employment screening and evaluation methods?
   a) In what ways are ePortfolios potentially of value to employers of engineering students in the assessment of an applicant during the hiring process?
   b) What information do employers of engineering students find useful and expect to find in an ePortfolio?
Purposeful, Criterion-based Case Selection Sampling

Careful selection of the participants for this study was paramount. Purposeful, criterion-based case selection sampling was employed for choosing the participants (Patton, 2015). Criterion sampling tends to solicit information-rich responses from participants (Patton, 2015), which was appropriate for the data the researcher was seeking on employers’ perspectives on ePortfolios. The participants met predetermined criteria; mainly they must have or had experience in hiring engineers.

Snowball Sampling

Snowball sampling (Patton, 2015) was also employed for this study. Snowball, or chain sampling, refers to relying on recommendations and networking to secure participants (Cohen, Manion & Morrison, 2011; Patton, 2015). Essentially, those who were recruited through purposeful, criterion-based case selection sampling were asked to refer others who they thought would be a good fit for the study. This technique allowed the researcher to solicit an additional participant for the study.

Selecting Participants for Study

The researcher worked with a University in Southeast Texas’ Engineering College Career Center and Honors College to secure participants for the study. At the University in Southeast Texas, there are three career centers for students: one centralized center for all students on campus, one unit for business students, and one unit for engineering students. The Engineering Career Center works with currently enrolled students and recent alumni to arrange participation in co-ops, internships, and full-time positions (Engineering Career Center, n.d.). The engineering fields supported include biomedical,
chemical, civil, environmental, computer, electrical, industrial, mechanical, petroleum, and sub-sea.

The researcher also coordinated with administrators from the University in Southeast Texas’ Honors College to recruit for the study. The Honors College has an undergraduate population of approximately 2,000 students. It is an interdisciplinary college, and supports students from a total of nine academic colleges on campus. Engineering students comprise about 25% of the Honors College student body. Engineering companies employ many Honors alumni, so this was another pool to recruit from for the study (The Honors College, n.d.). For instance, two of the participants in this ePortfolio study were human resources representatives, or talent recruiters, who had relationships with the Honors College.

**Contacting Participants for Study**

The staff members from both the College of Engineering Career Center and the Honors College provided the researcher with names and emails to contact. The email invitation included information on the study, such as the significance of the project and the projected time commitment for participants. As referenced earlier, potential participants interested in the study were asked to complete a demographic survey to screen their eligibility. They should have experience in assessing job candidates for engineering positions. In particular, they should have prior knowledge on the review of applicants’ résumés, cover letters, and other application materials, and be aware of their firm’s screening process for employment.

Once the surveys were received, the participants were selected for the study and contacted to schedule the interviews. In addition to the previously stated required criteria
from participants, there was also a preference for diversity among the pool of participants, including variety within ethnicities, gender, and ages; representation from small, medium, and large sized companies; particular engineering industries; and the participants’ time employed by their firms and the positions they held at their respective companies. Nevertheless, the researcher was bound by who agreed to participate in the study, so there was not as much variance among participants’ fields within engineering as preferred. The majority of the participants represented the oil and gas field (see Table 1). As a result, the lack of diversity in the participant pool was acknowledged and accounted for within the findings.

**Engineering Student’s ePortfolio**

Each participant in this study viewed the same Engineering Student’s ePortfolio. The interview questions for the study were intended to solicit participants’ perception and perceived usefulness of this Engineering Student’s ePortfolio within a hiring process. The Engineering Student’s ePortfolio for the present study was an actual ePortfolio that was created by an electrical engineering student. The site was built through Google Sites, and is currently live on the web and available to the public for viewing.

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 and **“Contact Me”** page were located under the “Welcome” tab; the “About Me” page included photos of the Engineering Student playing sports, and attending sports and music events;
“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; this section 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 of the research program pages included detailed information on research conducted, and the third research program page was in progress; 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;” this section 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.

This ePortfolio was chosen because it is 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 engineering. Garnering feedback on this ePortfolio may be helpful to college students and administrators associated with collegiate ePortfolio programs. Asking participants to view the same ePortfolio enabled the researcher to identify commonalities among their responses. In addition, by reviewing just one ePortfolio, the researcher was able to collect rich responses on each section of the student’s ePortfolio, and gain a deeper understanding of the participants’ perceptions of the potential for using the tool within the hiring process.

Pre-Interview Viewing

Once those who were eligible for the study agreed to participate by confirming their involvement, they received an email with the informed consent paperwork. This allowed the participants time to review the consent form before the interviews took place. They signed the actual consent form in-person when they arrived for their scheduled interview. If the interview was conducted over the phone, the consent form was emailed to the participant, and returned signed to the researcher before the interview began.

In advance of the interview, the researcher emailed each participant the same hyperlink to view the Engineering Student’s ePortfolio. Participants were asked to review the ePortfolio prior to the scheduled interview date and time. During the actual interview, the participants were asked questions regarding the Engineering Student’s ePortfolio they previously viewed.
Interview Process

The interviews took place in multiple locations. Some discussions with participants were located in a conference room at a University in Southeast Texas. This was a quiet, intimate space, and centrally located on campus. Other settings included additional public, neutral locations, such as hotel lobbies, cafés, and coffee shops. The Engineering Student’s ePortfolio was loaded on a laptop at the interview locations for participants to review as needed during the interview. If it was challenging for some of the participants to visit the University or travel, the interviews were conducted over the phone.

Interview Timing, Recording, and Observational Notes

The one-to-one interviews lasted approximately 30-60 minutes depending on the interview. The interviews went continuously without a break. The sessions were audio-recorded. Observational notes were taken during the interview process (see Observational Data).

Background Information on ePortfolios for Participants

The interview process began with a scripted introduction, approximately two-minutes in length, during which the participants were reminded of the purpose and significance of the study. This was done to ensure there were “no attempts to mask intentions nor to hide interpretations” (Clandinin & Connelly, 1988, p. 272). This scripted explanation on ePortfolios explained the definition and purposes of ePortfolios.

An engineering professor, who is also a professional engineer, was consulted while developing the design of the present study (see Face Validity). This professor stated it was important that the participants receive a brief synopsis on what ePortfolios
are and how they are used before proceeding with the interview process, so this was a pertinent step within the interview protocol. The participants had already received the hyperlink for the Engineering Student’s ePortfolio in advance of the interview (see Pre-Interview Viewing).

**Interview Questions**

The interview questions for the study were intended to solicit participants’ perception and perceived usefulness of the Engineering Student’s ePortfolio previously viewed (see Engineering Student’s ePortfolio). Employers participating in the study answered standardized open-ended interview questions (Patton, 2015). The interview protocol (see Appendix A) ensured the questions were typically asked in the same order, which reduced biases and made it easier to compare and analyze responses. Asking open-ended questions enhanced the likelihood that another researcher conducting a comparable study could achieve similar results because this technique encourages richer responses from participants. This interview protocol was similar to Hartwick and Mason’s (2014) inquiry process. In that study, the researchers gave their participants time to review an ePortfolio at the beginning of their session, and then asked the participants semi-structured interview questions about what they had just viewed.

However, not all questions were asked of each participant if the individual had already addressed the content of the question in a previous response. This meant there was a commonality to all of the interviews, but at the same time, participants had the opportunity to speak freely. Semi-structured interviews enabled participants to elaborate on issues that were more interesting to them (Hancock & Algozzine, 2011). This type of interviewing allowed the participants and researcher to add relevant information, ask
follow-up questions, confirm responses, and dive further into specific topics (Corbin & Strauss, 2015).

The interview questions for this study were constructed based upon the semi-structured interview questions of Fowler (2012). In addition to working from Fowler’s interview protocol, some of the interview questions derived from Hartwick and Mason’s (2014) study (see Appendix A). As referenced in Chapter II, Hartwick and Mason (2014) also conducted a study on employers’ perceptions of ePortfolios. In that study, 15 school principals were interviewed, and asked to review student teachers’ ePortfolios. Hartwick and Mason explored how self-introduction videos included within applicants’ ePortfolios might be used in the hiring process. They found that most principals would use the videos within their screening and evaluation methods. In addition to working from Fowler and Hartwick and Mason’s interview questions, some of the interview questions for the present study were developed by the researcher of the present study.

To measure the face validity for this inquiry, an engineering professor was asked to review the interview questions before the study commenced, and determine if the questions were likely to solicit the information the study was designed to investigate (see Face Validity). Overall, he felt the questions seemed to measure what they were intended to measure. However, as a result of his feedback, changes were made. Two of the questions were reordered, and the verbiage in three of the questions was changed. The primary concern he raised was that some of the questions were too similar. For this reason, two questions were omitted entirely. The other two questions he felt were similar remained within the study (Question #10 and #13). He was correct that they were
comparable, but #13 opened up the possibility for a conversation on aesthetics, design, and layout, and #10 was less likely to solicit this response (see Appendix A).

**Observational Data**

The responses to the research questions were also analyzed through observations. All of the interviews were audio-recorded, and copious observational notes were taken during the interviews. By coordinating the observational notes with the participants’ statements, the descriptive validity of the study was addressed (see Descriptive and Interpretive Validity).

**Field Notes**

In addition to building in time after each interview to review the observational data, time was also taken to consider the possible implications of what transpired (Hancock & Algozzine, 2011). These field notes included descriptions of the activities that took place during the interviews. The notations described the setting, participants, interview activities, and particular responses or exchanges that stood out to the researcher or seemed significant. This was an opportunity for the researcher to reflect upon the interview, drawing ideas and impressions from what transpired.

**Post Interview**

When the interviews were over, the participants were thanked for their involvement in the study. Within two weeks after the interviews, the participants had an opportunity to review the transcripts and pseudonyms and provide feedback if they felt their original intent was misunderstood. Their responses were taken into consideration by the researcher.
Data Analysis

The process of coding and analyzing the interviews resulted in identifying common themes and insights derived from the participants’ responses to ePortfolios. The participants’ professional background and experiences were taken into account during the data interpretation, and were known to the researcher at the start of the study. The research questions were answered through in-depth, semi-structured interviews, as well as through observational data and field notes. The analysis was a process of identifying patterns and commonalities within responses. 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). The interviews collected did not convey a single truth, but rather captured a phenomenon of how the participants perceived this tool.

Transcribing

The audio recordings of the interviews were transcribed by a dissertation transcription service. Once the researcher received a copy of each transcript, the participants were provided with the opportunity to view the transcript of their interview and approve their pseudonym for the study. This correspondence with the participants took place one to two weeks following their initial interviews.

Corbin and Strauss (2015) and Strauss and Corbin (1990)

Although this is a qualitative, phenomenological, multiple case study, the researcher drew upon Corbin and Strauss (2015) and Strauss and Corbin’s (1990) grounded theory to code and analyze the data. This process involved open coding, breaking down the data for analyzing and defining initial concepts and sub-categories,
Corbin and Strauss (2015) explained the process of implementing grounded theory as similar to building a pyramid. The researcher begins the analysis process by identifying lower-level concepts within the transcripts of the interviews and other data. Then the researcher defines categories based upon these lower-level or initial concepts through coding the data. As Corbin and Strauss recommended, constant comparisons were made between one piece of datum versus another piece of datum to decipher similarities and discrepancies within the present study (p. 93).

More specifically, their open coding approach was used to label keywords, and discover and name categories when analyzing the transcripts from the interviews. Then through the process of performing axial coding, the researcher identified subcategories. Open and axial coding were separate, distinct methods, but at the same time, were dynamic and “the researcher…alternate[d] between the two modes” during the analysis process (Strauss & Corbin, 1990, p.98). The software program Dedoose was used by the researcher to record and store data, identify the codes or initial concepts, code the transcripts, and interpret, analyze, and depict the data (see Appendix F & Appendix G).

However, in grounded theory a core category—or central category—is identified, which is the major theme of the research (p. 188). The core category is often a broad enough theme to represent all participants within the study. For this multiple case study it would prove challenging to identify a theme that would represent all participants. Nevertheless, this grounded theory technique of breaking down the data, then finding commonalities among the responses through coding, and finally articulating common themes that emerged was useful for this analysis.
Creswell (2003)

The guidelines of J. W. Creswell (2003) were followed as a secondary method for analyzing the data. Creswell suggested six central steps for analyzing and interpreting data for qualitative studies. His strategies for working with the data include: organizing the information, reading through the content, coding the data, generating descriptions, determining the way in which the findings will be represented, and making meaning from the findings. This type of in-depth analysis was critical in understanding and analyzing the interviews to develop the common themes and ideas that arose. This allowed for developing paradigms on what transpired in the study, and provided transparency in how the findings from the study were formulated. Fowler (2012) also drew from Creswell’s guidelines in his doctoral ePortfolio analysis.

Confidentiality and Data Management

Pseudonyms were used throughout the manuscript to mask the participants’ identities. The names of the participants’ companies were also not identified. The software program Dedoose was used to store, record, code, analyze, and present the data. The data collected, including the names and the corresponding pseudonyms of the participants, records of the coding of the interviews, and the transcriptions will be kept in a secure location for three years at an office at a University in Southeast Texas. The information gathered is backed up in two locations—on a computer at a University in Southeast Texas and on a backup server at the University. Access to the files is password protected.
Role of Researcher

As the coordinator of an ePortfolio program at a University in Southeast Texas, I was in an ideal position to serve as the researcher for this study. I possess the theoretical sensitivity to conduct this study (Strauss & Corbin, 1990). I am well versed on the literature in the field, and have worked with undergraduates from a wide range of disciplines on ePortfolios for over four years. I also teach an ePortfolio course with a colleague. This role includes developing an ePortfolio curriculum, course materials, instructional videos, guidelines, and assessment metrics, as well as advising students on using the tool. I have also personally developed ePortfolios using multiple software platforms.

As an instructor, my ePortfolio students often ask me if potential employers will view their sites, what they might like to see on their sites, and how they may perceive their portfolios. These consistent student inquiries, as well as the lack of published articles to address their questions, compelled me to bring this study to fruition. The findings from this dissertation will directly benefit a University in Southeast Texas’ ePortfolio program, as well as contribute to the greater field of career ePortfolios.

In addition, I have been employed at a university for over a decade. This enabled me to work from a broad network of colleagues on campus to recruit participants for the study. As previously mentioned, I worked with representatives from a University in Southeast Texas Engineering College’s Career Center. I also worked on recruiting participants through the Honors College, and through referrals by the participants of the present study.
Although I was unable to disassociate myself entirely from possessing a pro-portfolio mindset, I nevertheless worked to address the biases I possessed. For instance, I worked from and adapted interview protocols that were already tested and measured in other studies (Fowler, 2012; Hartwick & Mason, 2014) to ensure I was not asking questions that were leading or designed to elicit particular responses. It was the significance and value of the study that drove my analysis, and not my desire for favorable feedback from the participants (Clandinin & Connelly, 1994).

Validity of Study

For qualitative studies, rather than use the term validity, it is more appropriate to refer to the importance of an understanding of the study (Cohen, Manion, & Morrison, 2011). This understanding should be demonstrated by presenting the data in a way that is authentic to the participant’s intent. The instrumentation is extremely important; in this case the instrumentation was the researcher, the interview questions asked, how the responses were interpreted, and the observational data and field notes. Cohen, Manion, and Morrison (2011) suggest Maxwell’s (1992) five kinds of validity for qualitative studies to achieve this understanding: descriptive, interpretive, theoretical, generalizability, and evaluative (pp. 181-182).

Descriptive and Interpretive Validity

The descriptive validity of a qualitative study may be called into question if the presentation of the data presents a false representation of the participant’s actual meaning. A concern with the interpretive validity of a study can arise if the data is represented in only one way. Both meaning and intention must be captured for qualitative studies (Cohen, Manion & Morrison, 2011). Another interpretive concern is that the researcher
could expect the participant to respond a certain way. The researcher could base the interpretation of the person’s meaning on preconceived assumptions of their responses.

To address the descriptive validity for the present study, copious observational data were taken during the interviews, and reflective field notes were documented immediately following the interviews (see Observational Data and Field Notes). Recording and then analyzing the transcripts, observational data, and field notes addressed the descriptive validity of the study through employing this method of triangulation.

**Theoretical Validity**

It is essential that the researcher’s analysis of the data be in accordance with the actual documentation of the data. For example, the researcher may personally believe that an ePortfolio will be useful to an employer, but if he or she does not specifically say this, this is not an inference that should be made. Addressing theoretical validity begins with the literature review. As the researcher, I familiarized myself with similar studies in the field (e.g. Brammer, 2007; Fowler, 2012; Hartwick & Mason, 2014; Ward & Moser, 2008; Woodley & Sims, 2011) to ensure I had the expertise to assess and make meaning of my results. I was well positioned to conduct this study; I have studied ePortfolios for over four years—as a researcher, educator, and administrator in the field.

**Generalizability Validity**

In qualitative studies, generalizations can be problematic. It would be inaccurate and irresponsible to claim the findings from this ePortfolio study will apply to anyone who views a student’s ePortfolio. There are other concerns with the generalizability of this study, such as the limited number of participants who were interviewed, the
employers represented a homogenous profession, the participants’ possible preconceived notions about the use of ePortfolios, the particulars of the one ePortfolio they viewed for the study, and a possible desire by the subjects to please the interviewer. All of these issues and potential biases were taken into account when interpreting the data.

Receiving validation from the respondents is also an important factor in confirming the intended meaning is accurately portrayed within the study (Cohen, Manion & Morrison, 2011). This was done during the interview process by taking time to summarize some of the participants’ remarks, and asking follow-up questions to clarify their answers. It was also executed after the interviews by providing the participants with an opportunity to review the interview transcriptions, and clarify what was meant if the write-up did not convey their original intention.

**Evaluative Validity**

The evaluative validity of a study will be challenged if a conclusion is made based upon the researcher’s perceptions, and not the participant’s perception or data collected. For qualitative inquiry, the researcher is the instrument (Cohen, Manion & Morrison, 2011; Patton, 2002). It is essential to take into account the social world of the participant being interviewed. Developing “multiple coders and calculating intercoder consistency” establishes the validity and reliability of the analysis (Patton, 2015, p. 683). The researcher must be transparent in the collection of the data, interpretation of the data, and inferences drawn from the interpretations. It is also imperative that the researcher provides specific details on the study and the data collection and analysis, so that other researchers will have rich descriptions to work from when determining how to transfer the findings to a similar study.
Face Validity

Another way to address the validity of the research design is through working with experts in the field to confirm if the interview protocol and questions will likely measure what they are intended to measure. As mentioned above, to confirm the face validity of this study, the researcher conferred with a faculty member from the University in Southeast Texas’ Department of Electrical Engineering. He has served at the University for over 40 years as a professor, professional engineer, and administrator. He was also a researcher in the field of applied electromagnetics. For over 15 years, he has regularly presented at and attended the Engineering Leadership Board meetings. This is an industrial advisory committee to the engineering dean, and comprises career engineers from a wide range of fields. In short, this professor has worked with engineers for his entire professional career.

He also has direct experience in working with ePortfolios. He has viewed many student ePortfolios, particularly in the field of engineering. The professor served on a faculty panel that reviewed students’ websites for an ePortfolio course four times in the past three years. For these reasons, this individual was an ideal representative to evaluate the research questions, interview protocol, and the Engineering Student’s ePortfolio the participants viewed during the interview.

External Validity

To address the external validity of the study, the participants included employers who represented varied professional positions and levels of seniority at their respective companies. There was diversity within the ethnicities, genders, and ages represented in the study to address concerns with the validity of the sample selection (see Participants).
The age of the participants, which ranged from 34-60 years of age, was particularly important for this study. Whether the individual was a digital native or a digital immigrant may have informed their insights and feedback on ePortfolios (Prensky, 2001).

The participants also comprised engineers and professionals who represented multiple industries, including oil and gas, chemical, civil, and computer engineering, as well as the fields of exploration and production (E&P) and energy and natural gas. The validity was addressed by exploring the commonalities that existed within the groups that have been defined by age and industry. Nevertheless, the diversity of the pool was limited to those who agreed to participate in the study. In particular, equity in gender proved challenging. The male-female ratio within engineering is 4.61 in the U.S. (Aggarwal, 2013). Of the eight participants in the study who were engineers, only one participant was female.

**Pilot Study**

A pilot or feasibility study was conducted. This process was intended to identify any potential barriers or pitfalls within the design of the research project. The study also assessed whether the interview questions were likely to solicit participant responses substantive enough to adequately answer the research questions.

**Participant in Pilot Study**

A tenured faculty member from the University in Southeast Texas’ College of Engineering, who has worked at the University for over 25 years, served as the participant. This was a different faculty member than the professor who conducted the face validity for this study (see Face Validity). This individual received an email with the link to the Engineering Student’s ePortfolio in advance of the interview (see Pre-
Interview Viewing). The in-person interview took place at a conference room at the University in Southeast Texas. First the script explaining the nature of the study was read to him, and then he was asked the interview questions.

**Findings from Pilot Study**

The professor who participated in the pilot study provided detailed responses to the interview questions. He commented on the following topics: the most interesting sections of the site, the most helpful aspects of the site to the employment decision-making process, elements he would like to see in an ePortfolio, guidance for the ideal ePortfolio, recommendations on how to notify an employer of the existence of an ePortfolio, drawbacks and pitfalls of ePortfolios, suggestions on using ePortfolios as part of the hiring process, and the time he spent viewing the Engineering Student’s ePortfolio before the interview.

Overall he believed that if the ePortfolio were done well, an employer could better determine the skills of a job applicant who had an ePortfolio. However, he stated it would depend on the individual employer if an ePortfolio would make a difference in how a candidate might be evaluated. In the professor’s opinion, the potential for getting good information is so great that the ePortfolio should be used as a part of a hiring process. He recognized, however, this sentiment would not be shared universally.

*There would be some employers that will resist it. It’s nontraditional. It’s not the way it was done in the past, so that’s going to cause some barriers for some people.* (Pilot Study Professor)
He felt the website would be most useful to the candidate evaluation process before or after an interview. The Pilot Study Professor spent 15-30 minutes viewing the Engineering Student’s ePortfolio before the interview.

**Using Data from Pilot Study**

As a result of the rich data collected from the pilot study, the pilot participant’s replies were used as one way to cross-reference the validity of the feedback received from the actual study. The pilot participant’s responses were compared with the actual participants for the study. This was an additional means of assessing the validity of the findings.

**Interview and Peer Debriefing with Subject Matter Expert**

The director of the University in Southeast Texas Engineering Career Center was consulted several times throughout the study. Before the study began, she offered her feedback on the interview protocol. She then assisted with participant recruitment (see Selecting Participants for Study), and later in the process, she assessed the emerging themes.

**Interview with Subject Matter Expert**

The director of the University in Southeast Texas Engineering Career Center was consulted to garner her feedback before conducting the actual study. She reviewed the research design and interview questions. The director confirmed that the study was sound, and the questions were likely to solicit rich replies from participants. The director confirmed her willingness to assist in the recruitment of employers for this study. She appreciated having a copy of the interview questions because she believed it helped her in participant recruitment.
Peer Debriefing with Subject Matter Expert

The director of the University in Southeast Texas Engineering Career Center also conducted a peer debriefing with the researcher midway through the data collection and interpretation process. The peer debriefing is a validity procedure recommended by Creswell (2003) and was used by Fowler (2012) to authenticate the findings of his study. For this study, the Director assessed the preliminary themes and subthemes by reviewing the researcher’s notes and findings, and provided feedback based upon her expertise from working with engineering hiring managers, human resources directors, and recruiters. The director’s review of the findings and feedback supported the validity of the present study.

Participants

Eleven participants were interviewed for the present study. Eight participants were career engineers with hiring experience. Three participants were human resources professionals and specialists who recruit and hire engineers. Since 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-sized oil and gas companies. Other fields represented included chemical engineering, civil engineering, computer engineering, exploration and production, and electricity and natural gas. The age span of the participants was 34-60 years of age, and a broad spectrum of ethnicities was represented.

The following three tables and three figures (Tables 1-3; Figures 5-7) identify the participants, their professional backgrounds, fields, size of organizations, years in current
positions, years of hiring experience, genders, ages, and ethnicities. Following these tables and figures, the participants’ prior experience with ePortfolios is explained. Their professional bios and descriptions on their companies are also presented.
Table 1

*Participant chart including field(s) and size of company.*

<table>
<thead>
<tr>
<th>Participant</th>
<th>Professional Background</th>
<th>Field(s)</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arian</td>
<td>Engineer with Hiring Experience</td>
<td>Oil and Gas</td>
<td>Large</td>
</tr>
<tr>
<td>Daniel</td>
<td>Engineer with Hiring Experience</td>
<td>Civil</td>
<td>Medium</td>
</tr>
<tr>
<td>Donald</td>
<td>Engineer with Hiring Experience</td>
<td>Oil and Gas, Petroleum, Software</td>
<td>Small</td>
</tr>
<tr>
<td>Landon</td>
<td>Engineer with Hiring Experience</td>
<td>Chemical, Electrical, Industrial, Mechanical</td>
<td>Large</td>
</tr>
<tr>
<td>Mindy</td>
<td>Engineer with Hiring Experience</td>
<td>Oil and Gas, Chemical</td>
<td>Large</td>
</tr>
<tr>
<td>Ralph</td>
<td>Engineer with Hiring Experience</td>
<td>Oil and Gas</td>
<td>Large</td>
</tr>
<tr>
<td>Roberto</td>
<td>Engineer with Hiring Experience</td>
<td>Oil and Gas</td>
<td>Large</td>
</tr>
<tr>
<td>Shane</td>
<td>Engineer with Hiring Experience</td>
<td>Computer</td>
<td>Large</td>
</tr>
<tr>
<td>Elizabeth</td>
<td>HR Professional who Hires Engineers</td>
<td>Exploration and Production</td>
<td>Small</td>
</tr>
<tr>
<td>Laura</td>
<td>HR Professional who Hires Engineers</td>
<td>Electricity and Natural Gas</td>
<td>Large</td>
</tr>
<tr>
<td>Nathan</td>
<td>Specialist who Recruits Engineers</td>
<td>Oil and Gas, Petroleum</td>
<td>Large</td>
</tr>
</tbody>
</table>
Figure 5. Bar graph of participants’ primary industry.
Table 2

*Participant chart for years at current position and hiring experience.*

<table>
<thead>
<tr>
<th>Participant</th>
<th>Professional Background</th>
<th>Years at Current Position</th>
<th>Experience in Hiring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arian</td>
<td>Engineer with Hiring Experience</td>
<td>6-8 years</td>
<td>9-11 years</td>
</tr>
<tr>
<td>Daniel</td>
<td>Engineer with Hiring Experience</td>
<td>3-5 years</td>
<td>More than 15 years</td>
</tr>
<tr>
<td>Donald</td>
<td>Engineer with Hiring Experience</td>
<td>0-2 years</td>
<td>More than 15 years</td>
</tr>
<tr>
<td>Landon</td>
<td>Engineer with Hiring Experience</td>
<td>12-14 years</td>
<td>9-11 years</td>
</tr>
<tr>
<td>Mindy</td>
<td>Engineer with Hiring Experience</td>
<td>12-14 years</td>
<td>9-11 years</td>
</tr>
<tr>
<td>Ralph</td>
<td>Engineer with Hiring Experience</td>
<td>More than 15 years</td>
<td>More than 15 years</td>
</tr>
<tr>
<td>Roberto</td>
<td>Engineer with Hiring Experience</td>
<td>3-5 years</td>
<td>3-5 years</td>
</tr>
<tr>
<td>Shane</td>
<td>Engineer with Hiring Experience</td>
<td>More than 15 years</td>
<td>12-14 years</td>
</tr>
<tr>
<td>Elizabeth</td>
<td>HR Professional who Hires Engineers</td>
<td>6-8 years</td>
<td>More than 15 years</td>
</tr>
<tr>
<td>Laura</td>
<td>HR Professional who Hires Engineers</td>
<td>9-11 years</td>
<td>More than 15 years</td>
</tr>
<tr>
<td>Nathan</td>
<td>Specialist who Recruits Engineers</td>
<td>3-5 years</td>
<td>12-14 years</td>
</tr>
</tbody>
</table>
## Table 3

*Participant chart including gender, age, and ethnicity.*

<table>
<thead>
<tr>
<th>Participant</th>
<th>Professional Background</th>
<th>Gender</th>
<th>Age</th>
<th>Ethnicity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arian</td>
<td>Engineer with Hiring Experience</td>
<td>Male</td>
<td>38</td>
<td>Caucasian</td>
</tr>
<tr>
<td>Daniel</td>
<td>Engineer with Hiring Experience</td>
<td>Male</td>
<td>59</td>
<td>Caucasian</td>
</tr>
<tr>
<td>Donald</td>
<td>Engineer with Hiring Experience</td>
<td>Male</td>
<td>46</td>
<td>Caucasian</td>
</tr>
<tr>
<td>Landon</td>
<td>Engineer with Hiring Experience</td>
<td>Male</td>
<td>34</td>
<td>African-American</td>
</tr>
<tr>
<td>Mindy</td>
<td>Engineer with Hiring Experience</td>
<td>Female</td>
<td>36</td>
<td>Asian</td>
</tr>
<tr>
<td>Ralph</td>
<td>Engineer with Hiring Experience</td>
<td>Male</td>
<td>60</td>
<td>African-American</td>
</tr>
<tr>
<td>Roberto</td>
<td>Engineer with Hiring Experience</td>
<td>Male</td>
<td>38</td>
<td>Mexican-American</td>
</tr>
<tr>
<td>Shane</td>
<td>Engineer with Hiring Experience</td>
<td>Male</td>
<td>50</td>
<td>Indian</td>
</tr>
<tr>
<td>Elizabeth</td>
<td>HR Professional who Hires Engineers</td>
<td>Female</td>
<td>44</td>
<td>Multiracial</td>
</tr>
<tr>
<td>Laura</td>
<td>HR Professional who Hires Engineers</td>
<td>Female</td>
<td>51</td>
<td>African-American</td>
</tr>
<tr>
<td>Nathan</td>
<td>Specialist who Recruits Engineers</td>
<td>Male</td>
<td>39</td>
<td>Unknown</td>
</tr>
</tbody>
</table>
Figure 6. Bar graph of participants' ages.

Figure 7. Bar graph of participants' ethnicities.
Prior Experience Using ePortfolios and the Field of Engineering

Although Fowler’s participants had experience using ePortfolios, the participants in this study were largely unaware of what ePortfolios were regarding career purposes. Two of the 11 participants had a clear idea of what an ePortfolio was; the other nine participants had a vague idea or no knowledge of what ePortfolios were regarding career purposes (Figure 8). Only one participant in the study, Landon, 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.

This study shed light on whether employers who did not currently use ePortfolios would find the tool useful or not. To conduct this inquiry, it was important to select a field that does not typically use ePortfolios for hiring. Whereas there is higher usage of ePortfolios within the education and health care sectors (Ward & Moser, 2008), there is less usage within the field of engineering. This increased the likelihood the participants would not currently use ePortfolios within their hiring process, and the inquiry would be fruitful.
Each Participant’s Prior Knowledge of ePortfolios

![Prior Knowledge of ePortfolios chart]

Figure 8. Prior knowledge of ePortfolios.

Participant Bios and their Companies

Arian

Arian has over 14 years of experience within the field of oil and gas. For the past six years, he has worked as a sales manager for a large-sized oil field services provider. He is part of a technology group that supports the other divisions within the company, including onshore, offshore, and subsea businesses. His job requires troubleshooting clients’ issues in regards to separation, which involves developing the proposals and the pricing strategies to complete the jobs. His past positions include engineering jobs within process design, technical services, and process optimization at a large-sized company that delivers oil and gas internationally.

Arian does not have current hiring responsibilities, but is aware of the company’s hiring processes, and has experience reviewing candidates’ application materials for employment. He has also recruited and participated at career fairs at the University in
Southeast Texas, and has interviewed and assessed interns and entry level hires in the past. Arian has his bachelor’s degree in chemical engineering. He was recruited for this study as a result of his affiliation with the University in Southeast Texas Engineering Career Center Advisory Board.

**Arian’s Company**

Arian works for a company that is a provider to the oil and gas industry, and specializes in subsea systems and technologies. The company supports exploration and production clients by addressing their problems associated with drilling, technologies, and services. The company has locations in 18 different countries and employs over 15,000 individuals.

**Daniel**

Daniel is a vice president of a medium sized civil engineering organization. He has served in this position for over four years. Prior to this role, he worked for over 30 years with the department of transportation in various positions, including district engineer. He has hiring responsibilities in his current position, is aware of his company’s hiring practices, and has experience reviewing candidates’ application materials for employment. Daniel has his bachelor’s degree in civil engineering. He was recruited for this study as a result of his affiliation with the University in Southeast Texas Engineering Career Center Advisory Board.

**Daniel’s Company**

Daniel’s organization is the civil engineering division of a larger multidisciplinary consultancy company. The company provides transportation, water and sewer, aviation, drainage, land development, environmental, and consulting engineering services. The
organization has been in business for over 30 years, and employs approximately 150 employees within the southern region.

**Donald**

Donald serves as an executive vice president for business development and production solutions at a small-sized oil and gas consulting company. In this position, he is responsible for all aspects of the firm’s drilling and production service delivery. He has hiring responsibilities in his current position, is aware of his company’s hiring practices, and has experience reviewing candidates’ application materials for employment.

Among the many positions Donald has held, he has worked as a director for integrated services, a director of technology, and a manager of consulting and project management, technology, and technical projects. He has a long-standing history with the University in Southeast Texas’s Engineering College through recruiting and mentoring students who are preparing for a career in engineering. In addition to the University in Southeast Texas, he has recruited at campuses all across the United States, including institutions in the South, the Midwest, and at Ivy League campuses. Donald also has experience in hiring senior level executives for advanced business development strategies in the field of oil and gas. Donald has his bachelor’s degree in physics and electrical engineering, and master’s degree in electrical engineering and business. He was recruited for this study as a result of his affiliation with the University in Southeast Texas Engineering Career Center Advisory Board.

**Donald’s Company**

Donald works for an upstream exploration and production consulting firm that assists energy companies in working with financial and technological risks associated
with onshore, offshore, and deep water projects. The company provides geoscience and engineering consulting and resourcing solutions to clients across the world. Founded in 1999, this is a privately held company that supports approximately 200 employees.

**Elizabeth**

Elizabeth is a managing director of human resources (HR) and operations of a consulting firm that specializes in all areas of HR administration, talent acquisition, and retention strategies. She was recruited for this study by one of the clients she supports who is the chief executive officer (CEO) of the upstream oil and gas sector of exploration and production (E&P). Elizabeth works as this CEO’s director for human resources. As a consultant for a human resources company, however, she supports many other clients as well.

Elizabeth has had extensive hiring responsibilities for over 15 years, and has served in her current position for six years. Her human resource experience includes private equity firms, hedge funds, benefits, and human resource consulting industries. In her current role, she is responsible for the planning and direct oversight of client outsourcing services. Prior to this position, she worked as a director of human resources and administration for a private equity firm focused on energy and commodities. Elizabeth has her bachelor’s and master’s degrees in the field of psychology. She currently has hiring responsibilities, is aware of the company’s hiring processes, and has experience reviewing candidates’ application materials for employment.

**Elizabeth’s Company**

The company Elizabeth represented for this study is a small-sized privately owned midstream oil and gas company, exploration, and production. It is focused on the
acquisition of producing oil and gas properties. The firm is experienced in developing alternative reservoirs, and specializes in determining resource development in shale gas reservoirs.

**Landon**

Landon is a derivatives and utilities operations manager for a global chemical manufacturer. In this role, he leads several different process units and a utility area for the site, which is a unit of about 100 individuals. Landon is a chemical engineer who been with the company for 14 years. He began as a co-op/intern with the company while in college, and then transitioned into full-time employment with the firm.

Landon has worked in various other production engineering roles within his company, including assistant operations manager, lab manager, turnaround technical lead, furnace engineer, and aromatics engineer among other positions. He recruits through his company’s established co-op/intern program; much of the company’s talent recruiting draws from this pool. He also is part of the hiring process for full-time employees through other avenues. He and his colleagues recruit from the University in Southeast Texas Engineering College in addition to other universities across the country. Landon served as the lead recruiter at the University in Southeast Texas for approximately 10 years. Landon has a bachelor’s degree in chemical engineering. He was recruited for this study as a result of his affiliation with the University in Southeast Texas Engineering Career Center Advisory Board.

Landon is the only participant who shared his experiences using ePortfolios in the hiring process. When applying to his company, applicants are not required to submit an ePortfolio. Nonetheless, Landon has viewed ePortfolios in all stages of the hiring process
when presented by candidates—the pre-screening and prior and post interview processes. While Landon appreciated a student who shared an ePortfolio with him, he did not fault or judge someone who did not have a website.

**Landon’s Company**

Landon works for one of the world’s largest plastics, chemicals, and refining companies. The organization manufactures various types of oxygenated fuels and acetyls. The company, a member of the S&P 500 Index, also produces gasoline and diesel. The products manufactured contribute to the development of a wide range of products for everyday use. The organization develops products in approximately 60 sites within 18 different countries, and employs approximately 13,000 individuals globally.

**Laura**

For over 10 years, Laura has managed a recruiting staff for a large energy company. In this capacity, Laura handles issues pertaining to employee relations—primarily overseeing recruiting and staffing for the organization. She recruits, interviews, networks, and reports on all issues pertaining to talent acquisition for the company. Although she does not currently handle college recruiting, she did recruit on college campuses in the past. She also assists current employees in developing and enhancing their skills to improve performance in their working environments. She has hiring responsibilities in her current position, is aware of her company’s hiring practices, and has experience reviewing candidates’ application materials for employment. Laura has her bachelor’s in business administration, and her master’s of science in human resource development. She was recruited for this study as a result of her manager’s affiliation with the University in Southeast Texas’ Honors College.
Laura’s Company

Laura works for a domestic transmission distribution company of electricity, and sells natural gas. This utility company has been in business for over 100 years and support approximately 8,000 employees. It serves more than five million customers within 26 states throughout the United States. In addition to employing a broad spectrum of fields, the company employs electrical, civil, industrial, and mechanical engineers.

Mindy

Mindy graduated from the University in Southeast Texas in 2002 with an honors chemical engineering degree. Mindy joined a large global energy and petrochemical company right out of college, and has been with this company for over 14 years. Currently, Mindy serves as a supply manager for chemicals, working to ensure the division delivers their products to customers through the most economic, safe, and environmentally friendly mechanisms. Throughout her time with the energy and petrochemical company, Mindy has worked in a variety of positions with increasing responsibility over the years. Past positions include supply optimizer, asset coordinator and investment planning, refinery economist, and equipment and supply coordinator.

Regarding her hiring experiences, Mindy has employed a wide range of intern, entry level, and senior level positions. She has also been a member of her unit’s college recruiting team for approximately 10 years. For the past two years, she has served as campus manager at the University in Southeast Texas Engineering College. In this role, she supports the recruitment team and serves as a liaison with the company’s human resource unit and the University. Mindy and her team participate in career fairs, conduct campus interviews, and volunteer for other activities that support recruiting talent at the
University in Southeast Texas Engineering College. She was recruited for this study as a result of her affiliation with the University in Southeast Texas Engineering Career Center Advisory Board.

**Mindy’s Company**

Mindy works for a large energy and petrochemicals company. It consists of upstream, downstream, and integrated gas businesses, and employs approximately 90,000 employees in more than 70 countries and territories throughout the world. The company is one of the largest oil and natural gas producers and petrochemical manufacturers in the United States. Although the company’s headquarters is overseas, the company employs over 20,000 individuals within the United States.

**Nathan**

Nathan works as a recruiter, specifically as a campus development specialist, for a large oil and gas company. This is a new position for Nathan, but he has worked for over five years with this oil and gas company in prior positions within the field of operations. He served as a recruiter at his previous organization as well, which was a government-affiliated firm, and college recruitment was one of his duties in that position. Nathan has a background in the military. Before serving as a recruiter, he served in a wide range of positions within logistics readiness and materials management. His educational background is a combination of two separate fields: logistics and safety and education. Nathan has a master’s degree in occupational safety management and a master’s degree in educational leadership.

Nathan represents his company at career fairs, conducts campus interviews, and works with the director of the University in Southeast Texas Engineering Career Center
in other talent recruitment activities. He has recruiting responsibilities in his current position, is aware of his company’s hiring practices, and has experience reviewing candidates’ application materials for employment. He was recruited for this study as a result of his affiliation with the University in Southeast Texas Engineering Career Center.

**Nathan’s Company**

Nathan’s company is a large, public oil and energy company. It has been in existence for over 100 years, and supports over 10,000 employees. The organization explores, develops, and distributes oil and gas throughout the world. The company recovers existing energy sources, and creates new renewable and alternative energy sources, and operates in all areas of the field of oil and gas.

**Ralph**

Ralph has over 25 years of experience in the field of engineering. He is a professional engineer who currently works as a planning and fulfillment manager for a large oil and gas company. He has been working in this position for approximately two years, but has worked for the company for over 15 years. In his current position, he manages international teams and projects to support drilling and surface organizations. Ralph currently has hiring responsibilities, is aware of the company’s hiring processes, and has experience reviewing candidates’ application materials for employment.

Prior to this position, Ralph worked for three years as an engineering manager supervising a global team of process and mechanical engineers responsible for gasification technology. At the same company, he also worked as an engineering
development manager in power and water, and a requisition manager and new product introduction manager in aero energy.

Throughout his career, Ralph has hired hundreds of engineers throughout the world, including the United States, Mexico, China, India, Poland, and Hungary. Although he has hired engineers with doctoral degrees, the majority of his hiring has been of interns and entry-level engineers. He has also recruited young talent on campuses at career fairs and career centers throughout the states of Texas and Louisiana. Ralph has his bachelor’s degree in mechanical engineering, and his master’s of business administration in finance and financial management. He was recruited for this study as a result of his affiliation with the University in Southeast Texas Engineering Career Center Advisory Board.

**Ralph’s Company**

The large-sized company Ralph works for is headquartered in the United Kingdom, and employs over 40,000 employees. The firm serves constituents in over 150 countries, and is involved in all aspects of the oil and gas industry. The company also provides industrial power generation and compression and pipeline solutions to the refining and petrochemicals industries. Ralph’s division was part of the larger company, but in 2008, the public company underwent a reorganization and split into three new businesses. Ralph now works for one of the three new businesses.

**Roberto**

Roberto has built a career centered on all things related to energy. For the past two years, he has served as a senior liquefied natural gas proposal engineer. He is also the founder and executive director of a non-profit that supports the city to resolve social,
economic, and civic issues through education, training, and advocacy. His prior engineering positions include working for a technology company, leading the startup of the energy division of a project management group, and working at a mid-sized green/renewable energy firm.

While working at the engineering construction firm, he hired engineers, architects, and service workers, and handled the majority of the human resource responsibilities as well. At the green/renewable energy company, he participated in interviewing and evaluating processes of potential candidates. In his current position, the company has been on a hiring freeze until just recently.

Roberto has his bachelor’s degree in mechanical engineering from the University in Southeast Texas. He has his master’s and doctoral degree in mechanical/biomedical engineering from a university on the West Coast. Upon receiving his doctorate, he returned to the Southeast, and now has been a working as an engineer for seven years. Participant Arian recommended Roberto to the researcher as a potential engineer to interview for the study.

Roberto’s Company

Roberto’s company is affiliated with a large oil and gas firm, and supplies rotating equipment solutions to oil, gas, petrochemical, and process industries across the globe. The company has been in business for over 10 years, and employs over 10,000 employees. It has been under the larger oil and gas company for only about one year.

Shane

Shane has worked in the field of supply chain operations throughout his professional career. He currently works for a large information technology (IT) company,
and has been with the company for over 15 years. He serves as the worldwide business
operations manager for global support delivery supply chain. Shane manages a
worldwide team, and is charged with leading the engineering and quality organization.
Previous roles within the IT company include process engineering manager, operations
front line manager, and process engineer. Prior to working for the current IT company, he
worked at a smaller IT company, which was headquartered in the Midwest.

Shane has been a hiring manager for approximately 10 years. He hires mostly
engineers for the organization. Shane typically employs individuals from one of three
levels of expertise: college graduates, early career applicants, and experienced candidates.
He and his team members participate in college recruitment fairs, specifically at the
University in Southeast Texas as well as at other campuses. Shane also contributes to the
hiring of interns, and these interns often join the organization full-time once they
graduate. Shane has a bachelor’s and master’s degree in industrial engineering. Shane
currently has hiring responsibilities, is aware of his company’s hiring processes, and has
experience reviewing candidates’ application materials for employment. He was recruited
for this study as a result of his affiliation with the University in Southeast Texas
Engineering Career Center Advisory Board.

**Shane’s Company**

Shane’s IT company, headquartered on the West Coast and a member of the S&P
500 Index, has been in business for over 75 years. It creates and provides various types of
hardware and software resources to businesses of all sizes and sectors across the globe.
Recently the organization divided into two separate companies: a hardware technology
company and an IT company. Shane is affiliated with the IT company that employs over 100,000 individuals.

**Conclusion of Chapter III**

This chapter explained the research methodology and design for this study. It began with an explanation of Fowler’s (2012) ePortfolio analysis, and how the present study extended his work by changing two central variables. The section detailed the recruitment process, the research context, and the rationale for the study’s qualitative methodology. The research questions for this study were defined, and a description of the ePortfolio for the study was presented. The interview protocol was outlined. The way in which the data was transcribed, analyzed, and managed was described. Information on the researcher was provided. The validities associated with the research project were addressed. Information on the pilot study, and from the subject matter expert interview and debriefing were shared. The chapter ended with a presentation of the participants and their companies. Chapter IV will share the findings of the study. The Chapter is divided into four primary sections: strengths of an ePortfolio, drawbacks of an ePortfolio, probable uses for ePortfolios within the hiring process, and the participants’ recommendations for ePortfolio design for engineering students.
Chapter IV

Findings

The purpose of this study was to analyze employers’ perceptions of how the use of the Engineering Student’s ePortfolio might affect their hiring processes. The following research question and two sub-questions, adapted from Fowler (2012), were intended to provide answers to the issues raised within the statement of the problem.

1. What are the advantages and disadvantages of an ePortfolio over that of traditional candidate employment screening and evaluation methods?
   a) In what ways are ePortfolios potentially of value to employers of engineering students in the assessment of an applicant during the hiring process?
   b) What information do employers of engineering students find useful and expect to find in an ePortfolio?

This chapter outlines the themes and subthemes that emerged through interviewing individuals who currently hire or have previously hired engineers. The researcher attempted to address the research questions by conducting semi-structured interviews with 11 employers to garner their feedback on the Engineering Student’s ePortfolio website. As described in Chapter III, each participant received a web link to the Engineering Student’s ePortfolio prior to the interview. Then each employer interviewed was asked questions about the ePortfolio previously viewed. The interviews were semi-structured; some of the participants were interviewed in-person and others were interviewed over the phone. The data from the transcripts were coded. A peer
debriefing also took place to review the themes that emerged as a means of validating the data and analysis.

**Introduction**

This chapter includes a discussion of the major themes that emerged when analyzing the data, using participants' verbatim voice as support. The data used for this analysis included the interviews with the participants, audio recordings of the interviews, typed transcriptions of the recordings, observational notes taken during the interviews, field notes authored after the interviews, and coding and interpreting of the transcriptions.

Chapter IV is divided into four sections. The first section is a highlight of the potential **strengths** of using ePortfolios within the hiring process. The second section is a discussion on the possible **drawbacks** associated with using the tool. The third section is a showcase of the **probable uses** for ePortfolios within the hiring process. The fourth section is a presentation of the **participants’ recommendations regarding ePortfolio design** for engineering students creating ePortfolios. The diagram on the next page (Figure 9) demonstrates the organizational structure for Chapter IV.
Figure 9. Diagram of Chapter IV.
Strengths of Using ePortfolios—Section 1

Chapter IV Section 1 identifies the central themes that emerged related to the strengths of using ePortfolios. The section begins with illustrating the participants’ first impressions and overall perceptions of ePortfolios. Then the specific strengths of using an ePortfolio are described, including providing employers with the ability to (1) differentiate a candidate, (2) assess potential fit and future with a company, and (3) encapsulate a candidate’s traditional application materials and online media within one website.

Overall Perceptions of an ePortfolio

Overall, the Engineering Student’s ePortfolio was well received. The participants’ first impressions and overall perceptions of the website were favorable. Most participants saw value in the tool’s potential, and would consider using the website within their hiring process.

*It looks crisp. I like it...It looks good...I had to show it off to somebody else [laughter] who thought it was neat.* (Laura)

*I liked what I saw...and how it was presented...To me, this could be a template for other ePortfolios.* (Daniel)

*Overall, it’s still a very beneficial product and I think one that is very worthwhile for the student.* (Landon)

*In general, I like the ePortfolio.* (Ralph)

*I love the idea of it.* (Elizabeth)

*I’d certainly love to talk to him, if I could or if I had a position.* (Arian)
I think it’s a great idea. I think that if I’m advising young students, I’d tell them to absolutely do it. (Roberto)

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, Ralph travels quite a bit, and saw value in viewing an ePortfolio on a smartphone while waiting in an airport. Roberto preferred reviewing a candidate’s material on a computer rather than in print.

As somebody who's had a stack of résumés and has had to skim a whole lot, it was easier to skim. It was easier to skim because I can scroll, and my eyes are used to skimming on the computer. (Roberto)

Shane appreciated that the website could be viewed at the employer’s leisure.

The part that I liked about it was that it’s always there and at your convenience.

It’s always accessible. (Shane)

Specific Strengths of Using an ePortfolio

Concerning the particular strengths of an ePortfolio, there were three central themes that emerged. These themes were identified through the data collection and analysis. The participants believed ePortfolios provide employers with the ability to (1) differentiate a candidate, (2) assess potential fit and future with company, and (3) encapsulate candidates’ traditional application materials and online profiles within one website.

Theme 1—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 a candidate is evaluated. It allows them to better differentiate an applicant. For instance, if the ePortfolio is of a high caliber, it might be the deciding factor that leads to an interview.

*You can’t hide the lack of substance when you build a website, right? I think that alone tends to speak volumes because the person has to have something to put [in an ePortfolio]...They can do a good job for showing you more useful info than what you can get on a résumé alone.* (Landon)

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 more about the candidate from the ePortfolio. Elizabeth mentioned that employers tend to know what they are looking for before they start looking, so having this much information readily available was appreciated. The subthemes that emerged on how an employer might differentiate a candidate through an ePortfolio include learning more about an applicant's well roundedness, online brand, initiative, written and oral communication skills, and professional recommendations.

*Well Roundedness*

The participants appreciated that the website could demonstrate the well roundedness of a candidate by showcasing activities and skills beyond the résumé.

*And one thing that I value, especially having had to hire and fire people, is absolutely that well rounded background, and so I didn’t necessarily spend much time at all in his classes, but what I did spend was to try to see what his hobbies were and sort of his activities besides engineering...I think that it’s much easier*
for me to get my head around the well roundedness of the candidate versus just looking at a résumé. (Roberto)

The About Me section I thought was nice because I think it kind of tells you a little bit about outside the candidate. A lot of times, you’re looking for candidates who are well rounded so I think, off the top, some of the supplemental information that candidates put in there, whether it was a hobby, whether what sports they support or things of that sort, I found that interesting. I thought it was good to know about the candidate. (Shane)

The employers appreciated that they could glean information on research, projects, leadership, teamwork, extracurricular activities, and community service through the website. In addition to the About Me page, the Academic Projects, Research, and Leadership pages were also among the top rated pages. As a result, the ePortfolio was seen as adding value by providing this additional information.

Not everyone would have something like this so it adds more value I think, because in many cases, we just have a résumé to look at. (Laura)

The résumé is a very concise way to get a quick information, but I’m seeing things like [the ePortfolio] gives you a bit more depth beyond—a little bit more insight into the candidate beyond just the résumé. (Mindy)

Initiative

Participants repeatedly pointed out how much time the Engineering Student must have taken to create the website. Several participants mentioned that just having built the website distinguishes the candidate. It could indicate an applicant’s initiative, ambitiousness, or interest in being employed. Employers realize that recent graduates will
not have a lot of experience since they are just entering the workforce. This extra step in taking the time to create an ePortfolio could prove to be a distinguishing factor within the hiring process.

*An ePortfolio allows us a better view into a candidate than the conventional methods...So without a doubt, it shows the level of initiative to have one.* (Landon)

*If you’re putting together an ePortfolio, that sort of implies resourcefulness because you’re separating yourself from the norm.* (Roberto)

*One thing I did question in my mind, I’m thinking, all right, how much work, how much time, how much expertise was needed by the applicant to put together this e-format?* (Daniel)

*My initial reaction to the ePortfolio, it looks like a lot of work to put together, you know, for students to put something like this together.* (Laura)

*It shows that you took the extra step to present yourself in a very specific way, and when you’re young, and you don’t have a lot of experience that’s important.* (Elizabeth)

*Online Branding*

The ePortfolio was regarded as a sound tool for marketing and branding. The online medium was perceived as offering a holistic perspective on the candidate, and presents the entire “package” of an applicant. The digital medium and visual nature of the tool can showcase an applicant in a distinctive way. Since students are able to personalize their websites, they are essentially branding themselves to employers.

*I think there are certain industries where that works really well. Brand management for example, marketing...If this was brand management, I would tell
you this is the best thing that you could ever come up with because it’s one place where you can go instead of me having to surf Google to find out who you are. You’re giving me links all right here. (Elizabeth)

It’s more than a résumé. It’s definitely more than a résumé and it gives you the total package...I think it’s a great idea. I really like it. I even showed this to our manager of college recruiting and she loved it. (Laura)

Written Communication

In several interviews, the ability for students to be able to write and express themselves clearly was mentioned as a desirable attribute. The ePortfolio was perceived as a tool that could demonstrate a student’s talent in communicating effectively. The participants recognized that it requires more than a listing of accomplishments on a résumé to hire a strong candidate. It is important to learn how a candidate communicates these accomplishments and articulates their relevance that matters.

When I’m deciding between candidates, and I’m looking at something like this, now I have more weight to grade you on. That may be good, that may be bad, but if you’ve done it right, that’s going to be great because I can see how you write, and based on how you write, how you think. (Elizabeth)

In Arian’s current position, he is charged with writing proposals and contracts that compel clients to do business with their company.

I think the main thing that really would draw, at least someone like me in, would be the way it’s written...Writing is a key skill that I would be interested in...What I noticed is that [the ePortfolio] offers a space for communicating, writing. I think writing is an underrated skill for an engineer, especially in my line of work
because that's what we do... So I think in this sense that is where the ePortfolio can probably be a differentiator. (Arian)

**Oral Communication**

Although the Engineering Student’s ePortfolio did not include audio and video files, several participants expressed an interest in including audio and video files within ePortfolios. Viewing audio and video files would take place after the initial screening process has taken place to alleviate potential biases (see Drawbacks—Potential Biases). Ralph desired the Engineering Student’s ePortfolio to have included footage of the student talking, speaking, and moving—going beyond the text on the webpage to see how he communicates. Ralph was seeking a demonstration of the student’s actual personality to use as a differentiator during the later stages in the hiring process.

> After the initial filtration, you're looking for more information about an individual. Now, you're down to a short list, so now you’re trying to look for the differentiators. This use of the ePortfolio has the potential for differentiating things more than a résumé could—if you take advantage of it... So use the technology, but use it with a purpose. (Ralph)

Laura mentioned that her company now conducts digital interviews of candidates. This is an opportunity for a candidate who has passed through the initial screening process to address questions pertaining to particular competencies and soft skills via digital media. It gives candidates an opportunity to sell themselves before the interview stage, and enables the hiring manager to get to know the candidate. In light of the fact that Laura’s company uses digital interviewing, she believed hiring managers would
welcome introductory videos in a student’s ePortfolio. It would show the employer what
the candidate has to offer.

\textit{That could be something that’s really, really neat and even if they wanted to put
the video around some of their competencies...That way we can hear tone.} (Laura)

\textbf{Professional Recommendations}

\textit{I’d love to see a professor’s referral on some students.} (Donald)

The Engineering Student’s ePortfolio did not include professional
recommendations. However, utilizing the ePortfolio as a space for professional
recommendations was seen as an additional means of differentiating the student when
applying for a professional position. The ePortfolio could be a forum to share
professional referrals, testimonials, and letters of recommendation. The recommendations
would likely be from professors and previous employers.

\textbf{Theme 2—Assess Potential Fit and Future with Company}

Several participants shared that they are looking for the right fit for the long-term
when hiring applicants. Employers are 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.

\textit{A lot of times what tells you more about a candidate’s fit for the future
interestingly is [sic] maybe the nontechnical aspects of the \textit{résumé}, right? I think
that’s where you tend to look for things like, “Okay, tell me what else did you do
besides study?” Maybe you’re affiliated with some professional organizations or
you demonstrated some leadership skills or maybe you were a swimmer and
represented your university in the sport. That takes a lot of commitment.} (Shane)
I just want to know that you can learn, and that you can fit into our team... Those are the things that you can’t get until you do an interview I’d suppose, but at least, using the e-profile [ePortfolio], I can get a comfort level. (Arian)

Four subthemes emerged on how an employer could assess an applicant’s potential fit and future within the organization through an ePortfolio. These subthemes include learning more about a candidate’s: (1) personality and background, (2) creativity and thought process, (3) ability to work effectively within a team, and (4) adaptability and ability to cross train.

**Personality and Background**

Many of the participants interviewed appreciated the fact that an ePortfolio enables students to share their personality, and provide more information on who they are. The potential for the ePortfolio to showcase the personality of a candidate extends beyond what a traditional résumé offers employers. The ePortfolio was perceived as a forum for candidates to share their story or narrative. It also was seen as accelerating the time it takes to get to know an applicant. Most participants’ favorite page within the ePortfolio was the 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 served as an invitation to get to know the Engineering Student.

*I think you can learn a lot about who they are as a person from their ePortfolio.*

(Elizabeth)

*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.* (Mindy)
I kind of felt like I had an opportunity to kind of get to know the person before they arrive in my office to talk about a job opportunity. (Daniel)

An ePortfolio would give me more insight into his world, his lifestyle a little bit, where I could focus more specific questions and in turn I get to know him better, quicker, faster. I like that approach. (Donald)

Arian felt the ePortfolio could be used as a tool for students to share information of their background. He explained this could potentially draw-in recruiters and employers, and it might resonate with them—speaking to the candidate’s potential fit within the organization.

The stuff that was related to nonacademic, nonprofessional stuff was more interesting. I liked it...That type of information was interesting, and so that sort of resonated with me. (Arian)

Although this opportunity to get to know a candidate online was appreciated by most of the employers, not all participants wanted this information up front. Elizabeth and Roberto had some concerns regarding the sharing of personal information (see Drawbacks—Potential Biases). Elizabeth emphasized that she is first interested in what the candidate can do, rather than who they are as a person. However, she did value the About Me section later in the hiring process.

When it’s time to decide between you and another candidate, now I want to know everything I can know about you. That’s when I will really sit down and look at this, every single page and by every page, I mean I would read every word. (Elizabeth)
Creativity and Thought Process

Most of the participants rated the Academic Projects webpage as one of the most impactful aspects of the ePortfolio (see Most Helpful Web Pages). They appreciated seeing pictures and diagrams of the work the Engineering Student had completed. This provides evidence of what the student has created, and how he or she can potentially contribute to an organization. In this way, the ePortfolio can be used as evidence of students’ individuality and a demonstration of their creativity and thought process.

Providing evidence through diagrams, models, and videos showcase a student’s ingenuity and ability to design novel products—attributes key to the field of engineering. Although the Engineering Student’s ePortfolio did not include audio and video files, several participants expressed an interest in garnering feedback on a candidate through these media. Presentations could also be uploaded to the site. Ralph suggested students share evidence through video of something they built or created within their ePortfolios.

*If you produce something that is tangible, show me it working. Show if it was a robot or a racecar or whatever. Show it to me; make it maybe even entertaining...Give me something that says you have some creativity because essentially, on the design engineering side, it’s not necessarily the smartest that are successful. It’s those who see something and then see it different than everybody else. That’s what we’re looking for.* (Ralph)

Ability to Work Effectively within a Team

A consistent theme that emerged was the importance of hiring someone who could work effectively on a team. Many of the participants represented global companies
(see Participant Bios and their Companies), and this greatly impacts their work, the culture of their organization, and the importance of teamwork.

There is nothing you do individually anymore. It’s all a team concept and quite frankly, the global team concept is seamless. I assign projects...and a typical project might include people from three different countries...We want the energy, but we also want you to not be the lone ranger. Everyone has a role because we firmly believe that a group decision in the right kind of team environment is better than an individual decision. (Ralph)

So I’m not hiring you because you played high school or college basketball, right? But, I do value that you did that, and you had to respect authority, and you auditioned for something so you performed well with teammates. (Roberto)

Mindy also stated she would like to learn a student’s ability to work in teams and with different types of individuals. Laura’s firm is seeking certain competencies from candidates, as well as interpersonal and soft skills. She shared that the ePortfolio had the potential to demonstrate these competencies through scenario-based examples of how a student handles certain situations. (The Engineering Student’s ePortfolio did not include scenario-based examples.) Ralph concurred with Laura about wanting to see evidence of collaboration within an ePortfolio through the student explaining how the roles were dispersed in a group project, the likes and dislikes of the group project, and then share emotions on the overall experience. Arian emphasized the importance of learning the student’s specific role in a team project and learning the end result.

During the peer debriefing, the director of the University in Southeast Texas Engineering Career Center concurred that information on projects would likely be
desirable to employers, and shared that often recruiters have taken the same courses as the students they are now interviewing. If the employers have completed the same projects, they are much more interested in specifically how the student contributed to the project instead of the assignment itself. This speaks to having students reflect on or explain the team building experience associated with building products.

*Adaptability and Ability to Cross Train*

Most of the engineers interviewed for this study themselves changed employment positions on average every three years (see Participant Bios and their Companies). Demonstrating flexibility and an interest in the various roles within the organization are important attributes for engineers. Donald appreciated the potential for an ePortfolio to demonstrate a candidate’s adaptability and capability to work across disciplines. He felt the Engineering Student’s content on leadership and research could help to address these attributes. When hiring, Donald is seeking individuals who are interested in the world outside their specific role within the company. It is important to hire those who wish to understand other colleagues’ roles in addition to their own.

*Employers force [cross training] when you get hired and then they go through,*

“You’re going to spend two weeks here and two weeks here and two weeks here.”

*They’re forcing that cross training learning concept. If you already have that knowledge from the college perspective, they’ll be more easily adaptable in the organization, I think. And so I think there’s that part of it, the ability to focus on the cross discipline side of things.* (Donald)
Theme 3—Encapsulate Traditional Materials and Online Media

The employers appreciated the candidate’s ability to use an ePortfolio to encapsulate traditional application materials, such as the résumé, cover letter, and basic biographical information, with a variety of online media and profiles. Using the ePortfolio to digitally screen 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 tool.

I view this as a one-stop shop. (Landon)

I like the fact that it’s a one-stop shop—that if I saw a cover letter, a résumé in the background, then I don’t have to be fumbling through these papers. (Roberto)

The strengths of utilizing one would be just the fact of having the information readily available in my hands. (Nathan)

I love the idea of it. Again, it being a place, not just for them to express themselves in a professional way, but also it’s linking you to other things that are already established like what’s there... Anything that you think I should know about you and you can put it in one page; if I’m really interested in you, I want to know. (Elizabeth)

In addition, most participants mentioned LinkedIn in some capacity during the interviews. Participants use this professional social media site as a tool for networking and learning more about a candidate. Donald mentioned wanting to view the Engineering Student’s LinkedIn page, and liked the idea of leveraging the LinkedIn concept to the ePortfolio. Arian was interested in how LinkedIn and ePortfolios might talk to each other or how the platforms might integrate with one another. Several participants suggested
students coordinate their résumés, LinkedIn pages, and ePortfolios, so the messaging of all three media is consistent and readily available to employers.

For me, the LinkedIn integration would be interesting because a lot of people and professional recruiters do go to those sites to search for talents. So I think to help optimize the student’s time, the less they have to update multiple places, the more valuable it is that he or she can ensure that they have the latest information in there. (Mindy)

It was suggested that candidates also link to any other online media when creating ePortfolios, such as their blogs and professional web spaces, but not necessarily their personal social media accounts.

**Drawbacks of Using ePortfolios—Section 2**

Although the Engineering Student’s ePortfolio was generally well received, participants’ noted consistent drawbacks to using the tool. Through the data collection and analysis, Section 2 of Chapter IV presents the three central themes that emerged pertaining to the drawbacks of ePortfolio use. The participants believed introducing ePortfolios could result in a (1) duplication of efforts for the candidate and employer, (2) too much information presented to the employer, and (3) the tool being un成功地 introduced into the hiring process, particularly during the initial screening of candidates. The section concludes with sharing additional potential drawbacks, which were mentioned by selected participants.

**Theme 1—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, have
stringent application processes the candidate must complete. Typically candidates applying for positions are not required to submit ePortfolios. Mindy was concerned that a student would take the time to create an ePortfolio through his or her own volition, but the employer would not actually see it. In addition, many employers and candidates are already using LinkedIn as a tool for screening and networking during the hiring process.

*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.* (Mindy)

Arian questioned throughout the interview how an ePortfolio would differ from a LinkedIn profile. He was concerned that ePortfolios are in competition with this existing professional social media site. Recruiters are generally not accustomed to using ePortfolios, but they are aware of LinkedIn. Similar to Mindy, Arian raised the concern that students would be doing double work by creating both a LinkedIn account and an ePortfolio. It could mean additional work for the recruiter as well.

*The question [employers] would probably ask is what’s the difference and they’d probably go to LinkedIn more so than the ePortfolio.* (Arian)

To address these concerns, Mindy and Arian 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. One way to integrate the two platforms would be to share the ePortfolio link, or embed the actual ePortfolio into the LinkedIn account. Students might offer an explanation of what their ePortfolio
website features that the LinkedIn account does not include. Mindy argued that this integration would optimize the student’s time because it would require less updating in multiple web spaces. When asked if she would use the ePortfolio she viewed, Mindy stated she would use the aspects that did not duplicate the standard hiring process.

**Theme 2—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.

**Information Overload**

Laura stated recruiters review résumés within two minutes, so the ePortfolio has to be accessible to an employer, and not include too much information. Donald and Ralph agreed with Laura.

*I think the challenge might be there’s just too much information there and I’m going to pass. I don’t have time to deal with it...I hate to say that, but it’s all about making life easy to consume the information.* (Donald)

*Just because you can do it doesn’t mean you should...I don’t want to generalize, but if you go beyond about two levels, you need to ask yourself, “Is this providing value? Could we summarize a little later?”...Do your own editing to make sure it’s succinct.* (Ralph)

**Potential Biases**

Some participants acknowledged the challenge of 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. Roberto was concerned about
the potential subjectivities that could arise through ePortfolio use, particularly through sharing photos or hobbies that could be potentially divisive.

*If you have pictures there and the About Me, you’re probably introducing a lot more, maybe, subjectivity away from the academics and actual engineering...I think it would be very easy to make mistakes in that area, but I think it’s handled well, then it would be a strength, but I think it’s sort of a slippery slope.*

(Roberto)

Elizabeth expressed a similar concern that if too much information is shared, a candidate could be discriminated against. Elizabeth argued that providing personal information was giving the hiring managers too much content. She recommended giving employers less, so they are left curious about the candidate, and will want to learn more on their own accord.

*People don’t often intend to discriminate, but if you look like their cousin and they don’t like their cousin, it just is what it is...It’s unfortunate, but that’s the truth. And again, when a person puts in writing what their hobbies are, when they put in writing any ancillary detail may give too much color, so you want to make sure that you’re only sharing—you only go to a certain point.*

(Elizabeth)

**Theme 3—Unsuccessful Introduction into Hiring Process**

Most participants expressed their reliance on the résumé, and its intrinsic value to the initial step within their hiring process.

*I still standby the résumé.*

(Landon)

*Obviously, the first [part of the decision-making process] is the résumé. The résumé, I mean, that’s a hard hitter.*

(Nathan)
Employers 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 20-120 seconds. The résumé can easily be printed, shared, and written on by employers. The employers in the present study can 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.

So you know what you’re looking for and you just hone in on it really quick and you say “Okay, they got it or they don’t,” and you move onto the next one.

(Laura)

The participants agreed they would always begin their process with a résumé. In addition, Arian, Elizabeth, Laura, and Ralph would not use an ePortfolio within the initial step of the hiring process (see Probable Uses and Recommendations for ePortfolio Design).

For an entry level engineer, I still say—and maybe I’m just too much gray haired—but by and large, as the initial filter, I’m still going to rely on the résumé...You’ll get 100 to 1 submissions for every job and the better the job is, that number may go up, and depending on market conditions that goes up more...I could not see myself sorting through 100 ePortfolios. (Ralph)

I like résumés because they’re quick, right? I can print it out. I can give it to whomever I want to give it to. I can write all over it. I can make copies of it. I can do anything I want to do with it cause it’s in my hand. An ePortfolio has a lot of pages. The only reason I would be interested in that is if I’m already drawn in by the résumé. (Elizabeth)
Other Drawbacks of an ePortfolio

Some participants mentioned distinctive drawbacks that were not raised by other participants. Donald mentioned an ePortfolio could prove misleading to an employer. For instance, a student who is enrolled in few credit hours but is less motivated could have a more robust site than a student who is enrolled in more hours, but is actually a more proactive student.

*I could tell he spent time on this [ePortfolio]. The challenge is will everybody?...A student with less ambition potentially may have more time to do the ePortfolio...That could be misleading.* (Donald)

Laura made a similar point, explaining that a drawback of an ePortfolio would be the potential for competition among students. A more developed website would stand out in comparison to another website that did not include as much information. Of course, misleading information and competition among candidates are potential problems with traditional application materials as well.

The central drawback Landon presented was that if a company adopted an ePortfolio, there might be repercussions associated with becoming too reliant on the digital tool. This could result in fewer in-person interactions with the candidate during the hiring process, such as forgoing the second interview, or an organization deciding not to participate at collegiate career fairs.

*This could lead you down the path of, if done well, I know enough about the candidate to make a pretty educated decision without really interacting with the candidate as much as you maybe should.* (Landon)
Probable Uses for ePortfolios—Section 3

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. Chapter IV Section 3 is a discussion on the probable uses of ePortfolios. The participants in the present study shared their thoughts on when and how they would use an ePortfolio in their hiring processes. The section illustrates: (1) when and how in the hiring process the ePortfolio would be used, (2) how ePortfolios might affect timing within the hiring process, and (3) the time each participant spent viewing the Engineering Student’s ePortfolio.

When and How in the Hiring Process ePortfolios Would be Used

The participants shared their perspectives on when and how in the hiring process they were most likely to use ePortfolios. These include: before and after an interview, during the pre-screening process, throughout an interview, as a record-keeping instrument for the post-screening reporting process, as a way to catalogue potential future hires, as a means of building a rapport with a new hire, and when hiring an intern.

Preceding and Following an Interview

All participants stated they would review or use the Engineering Student’s ePortfolio in their hiring process. 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.

*If you’re down to that shortlist, I could see this being a great tool.* (Ralph)

*The ePortfolio would help leading up to the interview because I think most of the decisions would be made during the interview...The ePortfolio would help set some of the context leading up to the interview.* (Arian)

*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.* (Donald)

*I would use it before the interview and after the interview to...validate maybe some question that I have or just something to refer back to, but I would say both, before and after.* (Laura)

*Let’s say, you’ve got about a hundred applicants and you’ve got to maybe select five for the interview. I absolutely see the value of something like ePortfolio giving you that information that would help identify, “Okay, who do I really want to be in that top candidate? ”* (Shane)

**Pre-Screening**

The participants were divided in regards 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. For instance, Shane felt that using ePortfolios for the pre-screening would be a more dynamic hiring process for the employer.

*Going through 100 résumés of black and white paper is monotonous and boring...I would much rather look at something [visual] than just browse through 100 résumés.* (Shane)
On the other hand, Ralph and Donald were not interested in the tool for pre-screening.

*I could not see myself sorting through 100 ePortfolios.* (Ralph)

*It’s not a pre-screen tool for me...If I had 25 students to screen, [I’d] probably not [use the ePortfolio]. If I had three or four that I was interested in, I would definitely.* (Donald)

*Additional Uses*

Some employers felt the ePortfolio could be used in other ways. Donald thought it could be used as a reference during the interview.

*I would like to have this in front of me as I was talking to [job candidates] in place of the résumé, actually.* (Donald)

In this context, the ePortfolio could serve as a conversation prompter, or provide content that a traditional résumé does not offer. Donald suggested that the University in Southeast Texas make iPads available on the tables at career fairs for recruiters to utilize to view ePortfolios.

An ePortfolio might also be a helpful tool in the post-screening reporting process as well. It could serve as a resource if the employer did not currently have a position for the individual, but knew of a position becoming available in the future. Nathan mentioned storing competitive candidates’ ePortfolios in a “bank” and calling them up as future positions became available. Mindy felt it would be helpful for the 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

In Fowler’s (2012) study, his participants believed the ePortfolio saved time in the overall hiring process. In contrast, when the participants in the present study were asked about timing, they expressed varied opinions and therefore no dominant theme emerged. To begin with, Arian, Donald, Nathan, and Ralph believed the implementation would add time, but Arian and Donald felt better decisions would be made as a result.

*I would say that it probably adds maybe a handful of minutes to [the process], but I don’t mind that just because if I’m having an interview, or scheduled for an interview, or I’m planning on sitting down with somebody, I’d rather be prepared so I’d like to have as much information available as possible before getting into the discussion.* (Arian)

*So overall, the ePortfolio was actually very well done, I thought. I just challenge, if in a real environment, how many people are going to dive into it and understand it...There’s more material. There’s more information. I think you’ll make better decisions at the end of the day, but if I had more information, I would preview that. I think I would spend more time on a couple of candidates that I was intrigued about.* (Donald)

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. Donald, Mindy, Nathan, and Shane believed using the tool without officially integrating it into the hiring process would add time to the process.
I think it depends on how consistently it’s being used, so if everybody started using it...then it actually could be a timesaver because you only go to one platform... but if it’s used as a supplemental on top of something, I don’t see that as a timesaver, but just another way to present the information. (Mindy)

Daniel felt using it without formally adopting it by the company would not lengthen the review process.

I can’t see it lengthening the process. In my estimation, it can only improve it.

(Daniel)

Roberto stated the ePortfolio would save time in the pre-screening if it were *not* formally integrated into the hiring process, but would add time *if* adopted.

I think it depends on the system I have set up. If I have something where I have all my résumés plugged into a database and I’m keyword searching, then this would probably add a little bit more time. But if we’re just talking about, I collected a big stack of résumés from a career fair and I’m having to flip through them or I have a whole bunch of links, I think this saves time. I think it depends on the current process of HR. (Roberto)

Both Shane and Roberto believed utilizing ePortfolios would ultimately save time in the later stages of the hiring process, once the candidate pool is narrowed. The ePortfolio could be used as a resource guide rather than having to conduct additional screenings.

*It could help streamline things on the backend if you were looking to make a hiring decision and you need supplemental information on the candidate.* (Shane)
Landon 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 duration ranged from two minutes to two hours. The average among the 11 participants was 30 minutes. The following charts (Table 4; Figure 10) feature each participant’s total time spent viewing the ePortfolio.
Table 4

Minutes each participant spent viewing the Engineering Student's ePortfolio.

<table>
<thead>
<tr>
<th>Participant</th>
<th>Minutes Viewed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arian</td>
<td>30-45 minutes</td>
</tr>
<tr>
<td>Daniel</td>
<td>30-60 minutes</td>
</tr>
<tr>
<td>Donald</td>
<td>30 minutes</td>
</tr>
<tr>
<td>Elizabeth</td>
<td>2-3 minutes</td>
</tr>
<tr>
<td>Landon</td>
<td>20-30 minutes</td>
</tr>
<tr>
<td>Laura</td>
<td>5-7 minutes</td>
</tr>
<tr>
<td>Mindy</td>
<td>15-30 minutes</td>
</tr>
<tr>
<td>Nathan</td>
<td>30 minutes</td>
</tr>
<tr>
<td>Ralph</td>
<td>25 minutes</td>
</tr>
<tr>
<td>Roberto</td>
<td>4 minutes</td>
</tr>
<tr>
<td>Shane</td>
<td>90-120 minutes</td>
</tr>
</tbody>
</table>
Chapter IV Section 4 shares the recommendations the participants made regarding ePortfolio design. During the interview process, the participants suggested tips and guidelines for students when creating ePortfolios. The employers’ recommendations and strategies are detailed below. The section begins with a discussion on the interview participants’ recommendations when constructing an ePortfolio. These components include (1) keeping the Home Page concise, (2) developing a truncated version of the ePortfolio, (3) employing a ‘less is more’ approach to design, (4) taking advantage of the technology, (5) balancing the professional and the personal, and (6) considering other additional design tips. Next, suggestions on how to share an ePortfolio with an employer are explained. Finally, the most helpful and least helpful web pages within an ePortfolio are presented.
Keep Home Page Concise

Those interviewed agreed the Home Page should be kept simple. The participants explained that like a résumé, when they first visit a student’s Home Page, they would like the page to immediately provide them the information they are seeking. The résumé should be easy to locate from the Home Page. This information should include name, major, GPA, and job and academic experiences. The Home Page should serve as a high-level executive summary.

[The ePortfolio should be structured] with all the differentiators upfront...Give me name, address, degree, when you’re graduating and pick through all those things, the noteworthy things you want me to know, whether that is written, audio, visual. Give me that five-minute we would call the executive summary. Give that to me, but unlike some of the other executive summaries, this could be a combination of media. So I go through all of that in five minutes and that tells me, “Do I want to go through the rest of it?” (Ralph)

You must want some sort of executive summary, if you will, at the front so you can get right to the résumé and get the biographical information that you’re seeking. (Nathan)

The professor who participated in the pilot study explained the Home Page should be treated as if it were a news article, with the pertinent information at the top. In the same vein, Elizabeth essentially would have liked the résumé to be the Home Page, or at least easily accessible from the Home Page.

If you can give me the equivalent of a résumé, if you want to set that up as bio—the fewer words, the better. I want bullets. I want to know what you did and you
can tell me anything. I don’t care what you’re telling me. You can paint the best picture in the world, just make sure that those things that are critical to the job are somewhere at the top. (Elizabeth)

**Truncated and Printable Version of ePortfolio**

Given employers’ reliance on the résumé (see Drawbacks—Unsuccessful Introduction into Hiring Process), it was suggested that the ePortfolio could include an option for an employer to print a concise version of the website to complement the résumé. The additional content should not duplicate the résumé, and should be formatted in such a way that can be easily printed. This would be a way for the hiring recruiter to easily deliver the additional information included in the ePortfolio to the hiring team.

**Less is More**

*Whatever you can do to make life easier, people will tend to use it more.* (Donald)

A consistent subtheme that emerged was to keep the ePortfolio clean and simple. The ‘less is more’ sentiment was embraced by those interviewed. A recurring notion expressed by the participants was that if you make the recruiters life easier, they will be more apt to use the ePortfolio and the candidate will fare better.

*I think it’s all in how a student structures it on whether or not it’s going to be useful.* (Landon)

Mindy agreed with Landon, recommending students develop a succinct ePortfolio that is clean and remains up-to-date. Just as the Home Page should serve as a summary of skills, the entire site should be concise, and the navigation should be logical and easy to use. Many participants appreciated the ability to navigate easily from page-to-page in the Engineering Student’s ePortfolio. The user does not want to get lost within the website.
Roberto described the website’s navigation bar as the outline for the entire ePortfolio. Shane recommended that students consider organizing their ePortfolios as they would when creating slides for an oral presentation; the pertinent information should be on the front end slides and the supplemental information should be included on the backup slides.

There should also be some degree of constraint demonstrated when using the technology. Ralph recommended that students should consistently ask themselves if what they are adding to their ePortfolio actually adds value (see Too Much Information Presented to Employers). Roberto concurred with Ralph that the ePortfolio should be concise.

*I think what was important for me, especially as I’m trying to figure out who I’m going to interview, is [for the ePortfolio] to be very streamlined...If I have to click to get to anything that I’m looking for in more than two clicks, three at the max, I’m not going to waste my time.* (Roberto)

**Take Advantage of Online Medium**

It is prudent for students to develop an ePortfolio that takes full advantage of the online medium. It is useful for ePortfolio creators to hyperlink information, upload video and audio files, and insert artifacts that are engaging. Several participants in the present study expressed an interest in including audio and video files (see Strengths—Oral Communication). For instance, at Ralph’s company, everyone has a smartphone, so he made the point that reading a lot of text on a two-inch screen is challenging. Watching videos and listening to audio files on a smartphone is easier for the user.
I felt this tool has tremendous potential if you add more audio and video... I don’t want to read all this stuff... Show me some video of you doing something other than a classroom—a soccer goal or shooting a hoop or putting a dance move.

(Ralph)

Balance the Professional and the Personal

Given the inherently personal nature of the ePortfolio, balancing the professional and the personal information can prove challenging for students. Both Donald and Roberto emphasized finding 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.

To alleviate potential subjectivities that can arise by sharing photos and personal information, Roberto suggested that during the pre-screening a candidate could include background information through text, but not include photos. Then after the pre-screening and interview process, the hiring team could view the candidate’s photos. To implement this suggestion, however, it would require a company integrating ePortfolios into the official hiring process, and having the technical functionality to choose whether to display or not display photos, or instructing applicants not to include images.

Donald and Shane recommended that students ask professionals to review and critique their sites. Shane believed asking a member from the student’s target audience would be ideal, such as a human resources representative or hiring manager. In light of this suggestion, during the peer debriefing the director of the University in Southeast
Texas Engineering Career Center shared that hiring managers continually express their desire to build relationships with candidates. Asking employers to view an ePortfolio may be a way for students to build a rapport with employers, as well as to determine if their ePortfolios are professional.

**Additional Tips When Creating ePortfolios**

The employers offered other tips to students when creating ePortfolios. Pitfalls for ePortfolio developers to avoid include having web pages that are under construction or not yet developed, broken hyperlinks, and using acronyms that would be unclear to an employer. Full-length documents should not be uploaded; instead consolidate the artifact to one to two pages. Elizabeth recommended including dates within an ePortfolio.

*Even if you only worked for six months that’s still a big deal because everybody starts somewhere, so don’t hide that fact, like don’t hide your dates.* (Elizabeth)

**Sharing the ePortfolio**

Those interviewed suggested a link to the student’s ePortfolio should be included on the résumé. 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.” Elizabeth mentioned this additional line might replace the References section, and lead people to the ePortfolio’s About Me page. On average, a recruiter reviews a résumé for less than two minutes, so the ePortfolio link has to be something they can access quickly. For this reason, it was suggested that the hyperlink for the ePortfolio is a short URL or web address.

Donald recommended adding a QR code to the ePortfolio on a résumé. A QR or quick response code is a barcode that users can scan using their smartphones, and it will direct them to a corresponding website. It was also suggested to include the ePortfolio
link within a cover letter, LinkedIn page, or business cards. If it is a digital cover letter, the candidate should embed the ePortfolio link for ease of access. A student should not send the link to the ePortfolio unsolicited to an employer. The candidate should have already met the employer or have networks in common before sending an email with a link to the website. Roberto recommended customizing the ePortfolio to target particular fields and positions. For example, a student might share some aspects of the ePortfolio when applying for a job in oil and gas, and other components of the website when applying for a position in green energy development.

Nathan suggested that colleges and universities could house all the students’ ePortfolios on a central site or portal for employers. Then those with hiring authority could easily conduct keyword searches on the websites when recruiting students.

*If it was just one central location, it will be a lot easier for us just to go—click up—there it is—and here’s the candidate we’re looking for. It would be beneficial if on that site if it was a repository for all the different ePortfolios; if I can narrow it down to [what] I was looking for.* (Nathan)

**Most Helpful Web Pages**

The participants were all asked which ePortfolio components would be most helpful and least helpful to them in their decision-making process. As the researcher described in Section 1 (see Strengths of an ePortfolio), employers valued the ePortfolio for its ability to better differentiate a candidate, assess an applicant’s potential fit and future within the organization, and encapsulate the traditional application materials with online resources. As a result, many employers believed the following pages would be the
most helpful to them in their hiring process:

(1) Home Page/Executive Summary—with name, GPA, and major.
(2) Résumé.
(3) About Me.
(4) Academic Projects.
(5) Research.
(6) Leadership.
(7) Service and Teamwork.
(8) References.

Least Helpful Webpages

Many participants felt the Relevant Coursework and Curriculum web pages were the least helpful aspect of the ePortfolio. Nevertheless, it was pointed out that there would be a use for these pages in some contexts. Ralph explained that most engineering students from American universities share the same curriculum; reviewing a list of the courses a student has taken is not of interest. However, if the student were from a program overseas, information on the degree plan would be more relevant. Landon appreciated the curricular information if reviewing a transfer student’s record. Arian and Roberto also found the Relevant Coursework and Curriculum the least interesting aspect of the student’s ePortfolio, but did see the value of the listing if hiring for an internship position.

I saw that there was a link to core classes. I wasn’t interested in that area. I generally know what sort of classes that undergraduates take...so that wasn’t so important to me. If I was [sic] hiring for an intern, I think that probably is much more important. (Roberto)
During the peer debriefing, the director of the University in Southeast Texas Engineering Career Center concurred. She argued that information on coursework, especially the upper-level courses, is helpful for an internship position because the student has not yet graduated. Once the student has graduated, she explained, there is no need to delineate courses. Be that as it may, she admitted she had seen first-hand recruiters argue about this point. In short, some employers like to view a listing of coursework and others do not.

In addition, the participants rarely mentioned the Honors and Awards as a favorite page. Nathan mentioned liking it, but Laura actually stated it would be the least helpful page within her decision-making process. Since employers rely heavily on the résumé, they likely already have the Honors and Awards information included in the résumé, and do not need it duplicated in the ePortfolio.

**Conclusion Chapter IV**

Chapter IV presented the results from this ePortfolio study on employers’ perspectives on an Engineering Student’s ePortfolio. The researcher will discuss in Chapter V the ramifications of these findings, and the implications of the answers to the study’s research questions. The findings from the present study will be compared with Fowler (2012) and Hartwick and Mason’s (2014) studies for examination. The researcher will also present essential criteria for engineering students creating ePortfolios based upon the findings from this investigation.
Chapter V

Discussion

The objective of this qualitative analysis was to learn more about what employers desire from college graduates entering the workforce. Employers are seeking ways to better determine applicants’ readiness for jobs, and graduates are interested in distinguishing themselves when entering competitive job markets. Using career ePortfolios could be one way to address both of these needs, but more research should be conducted to garner employers’ feedback on these tools for employment (Woodley & Sims, 2011). This study explored employers’ perceptions of ePortfolios, and the specific aspects of ePortfolios they find most and least relevant for their hiring needs. Fowler (2012) conducted a similar study in the field of career ePortfolios, which focused on the service and manufacturing sectors. This study built upon Fowler’s study, but analyzed the engineering sector.

Introduction

This chapter begins with restating the research questions for this qualitative analysis on employers’ perspectives on an Engineering Student’s ePortfolio. The ways in which the questions were answered are explained. The ramifications and implications of the answers to the questions are then discussed. Next, the researcher compares and contrasts the findings of Fowler (2012) and Hartwick and Mason (2014) with the results from the present study. Then essential criteria are presented for engineering students developing ePortfolios based upon this study’s findings. The limitations of the study, and the ways in which issues of validity were addressed are then examined. Suggestions for future research projects are explored. Finally, the chapter concludes with a summary of
the analysis, and explains how studies within the field of education that connect with 
external campus community partners are critical for student success and higher education.

**Restatement of the Research Questions**

The following research question and two sub-questions, adapted from Fowler (2012), 
were intended to provide insight into this investigation on employers’ perspectives on an 
Engineering Student’s ePortfolio.

1. What are the advantages and disadvantages of an ePortfolio over that of 
   traditional candidate employment screening and evaluation methods?
   a) In what ways are ePortfolios potentially of value to employers of engineering 
      students in the assessment of an applicant during the hiring process?
   b) What information do employers of engineering students find useful and expect 
      to find in an ePortfolio?

**Addressing the Research Questions**

The research questions for this analysis on employers’ perspectives on an 
Engineering Student’s ePortfolio were addressed through employing a qualitative, 
phenomenological multiple case study. The in-depth interview responses of 11 
participants were recorded, interpreted, and examined to address the study’s research 
questions. The transcriptions were coded, and the emergent themes and subthemes were 
identified, organized, and analyzed. Recommended criteria for engineering students to 
utilize when building ePortfolios were developed as a result of the findings.

**Implications of the Answers to Research Questions**

The answers to the research questions for the present study have ramifications for 
the fields of career ePortfolios, career readiness, career services, and higher education at
large. More specifically, the findings have implications for students developing ePortfolios, faculty and staff in higher education offering or are considering the creation of ePortfolio courses and programs, and employers evaluating the use of ePortfolios in their hiring process.

**Implications for Students Developing ePortfolios**

There is no question that hiring trends—particularly recruiting practices—are becoming increasingly digitally driven. Jon Bischke, CEO of a recruiting company, stated:

Twenty years ago, the résumé was a piece of paper. Now, it's a collection of all [candidate] data that can be found online, like participation in online communities, conferences and meet-ups. Recruiters can assess whether a person will fit, and learn if he or she has the right skills for a job.

(as cited in Taylor, 2016)

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 during their interviews. Clearly employers rely on the Internet when conducting 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 prevailing themes among participants were 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.

*An ePortfolio allows us a better view into a candidate than the conventional methods.* (Landon)

The participants in the present study 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, the student has an opportunity to explain how changing majors, or taking time off of school and then returning, enabled the student to get back on the right track.
One-Stop Shop for Employers

Another prevailing theme was that the ePortfolio encapsulates a candidate’s traditional application materials and online media within one website. 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, it is prudent for students to 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 serve as the hub, all the spokes must be aligned. It is important that the messaging is consistent among platforms and 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. As referenced in the literature review, given how many jobs people typically work throughout their lifetime, those seeking employment should 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.

**Implications for Educators**

Future studies within higher education should seek to address the scrutiny the field is under by employers, community partners, and funding agencies, such as state legislatures, who are concerned about graduates’ preparedness to enter the workforce. If employers believe college graduates are lacking critical thinking skills (Flores, Matkin, Burbach, Quinn, & Harding, 2012), researchers within higher education should probe further to better understand these concerns. Educators can best address the concern of student career readiness, and show their commitment to developing a skilled workforce, by engaging *directly* with employers.

In addition, educators within higher education are responsible for supporting students in their pursuit of a degree. This commitment includes broadening and enhancing students’ intellectual capacities to prepare them for successful careers upon graduation. As the review of the literature in Chapter II identified, demonstrating 21st century skills is integral in job placement. Within the field of engineering, the ability to communicate effectively, collaborate with others, and think creatively is critical (Butcher, 2013; Chou, 2013; Tully, 2012). The findings from this study provided evidence that an ePortfolio can showcase these skills to employers. Offering an ePortfolio course or ePortfolio component to an existing course is an ideal means of helping students showcase these skills.
Teaching Best Practices in Creating and Managing Online Presences

Given that hiring trends are becoming increasingly digitally based, (see Implications for Students Developing ePortfolios) providing students with an additional tool for employment can assist them in entering the job market. However, students must be aware of the potential for biases by employers when sharing personal photos and information online. Teaching students about ePortfolios presents an ideal opportunity to converse on these subjectivities. Educators should inform students on potential biases, perhaps through a discussion and analysis 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 to potentially access. Teaching college students about best practices on the web, and recognizing the potential for biases will assist them when entering the job market.

Guidelines for Educators Teaching ePortfolio Courses

Chapter IV Section 4 included recommendations the participants made regarding ePortfolio design. Some of these elements included (1) developing the Home Page as an executive summary, (2) exhibiting academic and professional projects, (3) employing a ‘less is more’ approach to design, (4) taking advantage of the technology, and (5) balancing the professional and personal aspects of the website (see Recommendations for ePortfolio Design). Educators who are developing ePortfolio courses, particularly in the field of engineering, should take these suggestions into consideration. In addition,
essential criteria for engineering students building ePortfolios are presented at the end of Chapter V (see Essential Criteria for Engineering Students’ ePortfolios). These criteria can be used as a template for students to work from when developing their online profiles.

**Implications for Employers**

Given that the ePortfolio was well received by employers and offers more information that a traditional résumé, hiring departments might consider restructuring their practices to include the acceptance or requirement of portfolio type material. As referenced in the literature review, those with hiring authority are interested in learning about candidates’ communication skills, imagination, and productivity (Shephard, 2009). This study found that these attributes could be showcased through an ePortfolio, which speaks to the value of this tool for employers.

**Benefits of ePortfolios for Employers**

It is possible that ePortfolios could save companies time and money. On average, a poor hiring decision costs a company 30% of that new potential hire’s first-year earnings (Hegel, 2015). Electronic portfolios would provide employers with more information when making decisions about which candidates are the best fit for available positions and the culture of the organization. In addition, the fact that the participants in the study cited spending an average of 20-120 seconds reviewing a résumé, certainly there is a potential for some qualified candidates to get overlooked. Having additional information at their disposal could be useful during the hiring process, as well as for storing links to ePortfolios in a database for later use should additional positions become available (See Probable Uses for ePortfolios).
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 this medium. To be useful to employers, the ePortfolio must be structured so that it provides the evidence employers are seeking, and in the format in which they would like to receive the information. The participants for the present study were divided as to when in the process they would use the ePortfolio, for what purpose, and how it might affect the timing of their overall hiring process. For instance, this study revealed that HR representatives (Laura and Elizabeth) would use the ePortfolio differently than hiring managers (Ralph and Donald). Laura and Elizabeth did not want too much information available to them when conducting the pre-screening process. If adopted by their companies for early usage in the hiring process, they would prefer a truncated version of the ePortfolio. Whereas Ralph and Donald, who in their respective positions are involved in the hiring process after the pre-screening, were interested in reviewing the ePortfolio in its entirety.

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.
Addressing Potential Biases

It is also important that safeguards against biases be fully considered before implementation. As one way to address potential biases, Roberto suggested that when using ePortfolios, the photos would be unavailable to employers until after the pre-screening process (See Recommendations for ePortfolio Design). This could be implemented by adopting the suggestion of using a truncated ePortfolio during the pre-screening, and then reviewing the entire ePortfolio later in the process (See Recommendations for ePortfolio Design). Other workarounds for organizations would be to not allow candidates to include any photos of themselves or any other identifiable descriptors, such as information on ethnicity, gender, age, etc. The ePortfolio could also only be used during an interview to encourage dialogue with a candidate, or after an interview has taken place to fact-check and garner any additional details that were not covered during the in-person visit with the candidate.

Comparing Findings from Fowler (2012) with Present Study

This qualitative study analyzing employers’ perspectives on an Engineering Student’s ePortfolio drew from Fowler’s (2012) examination. The research questions, methodology, and interview questions for the present study derived from Fowler’s ePortfolio study on the manufacturing and service sectors. The results from this study on the engineering sector both compared and contrasted with Fowler’s results. Fowler’s findings included the following:

Participants felt electronic portfolios containing the right information saved them time and money when seeking to hire skilled laborers. The findings also showed electronic portfolios to provide greater depth of information, more accurate
information, connections amongst the information presented, and more detailed information. (Fowler, 2012, p. 201)

For the present study, the engineering employers agreed that ePortfolios provided more depth and breadth of information. The engineering employers disagreed that ePortfolios would save time and money in the hiring process. The similarities and discrepancies between the two studies are detailed below.

**Similarities between Two Studies**

Fowler’s (2012) findings corresponded with some of the emergent themes in the present study. The similarities are outlined within the following section. They include the employers’ overall impressions of ePortfolios, and the demonstration of teamwork, projects, and communication skills. In addition, the ability to encapsulate traditional application materials and online media, and the capacity to address potential fit within a company or team were also similar themes for the two studies.

**Overall Perceptions of an ePortfolio**

The employers’ overall perceptions of an ePortfolio were similar for both studies; the ePortfolios were generally well received by participants. The ePortfolio provides more information up front and therefore offers a clearer depiction of the candidate. The participants from both studies agreed that ePortfolios could assist in differentiating applicants, and demonstrate a candidate’s commitment to service and initiative. To illustrate these similarities, below are comparable responses from the participants in the present study and Fowler’s study.
Initial Impressions

It looks crisp. I like it...It looks good....I had to show it off to somebody else [laughter] who thought it was neat. (Laura)

I would probably make comments to the director like, “wow, take a look at this” (Fowler, 2012, p. 110).

Differentiate

It allowed you to go below the surface and dig in a little bit more if you choose to. (Ralph)

If they can provide supporting documentation like computer codes or schematics you can really dig into the person’s abilities and knowledge (Fowler, 2012, p. 165).

Volunteer Activities

I’d like to see some community involvement potentially. It’s nice to see what kind of volunteer stuff they do. (Donald)

I want to see a person’s volunteer work. How much volunteer work they do and why they do it (Fowler, 2012, p. 144).

Initiative

If you’re putting together an ePortfolio, that sort of implies resourcefulness because you’re separating yourself from the norm. (Roberto)

This [ePortfolio] takes extra work so if you find an applicant that has gone to the extra work they would be a step ahead (Fowler, 2012, p. 111).
Evidence of Teamwork, Projects, and Communication Skills

Participants in both studies desired samples of candidates’ work and projects to authenticate skills and assess their capabilities. They also sought evidence of how applicants communicate, think critically, and make decisions. They desired the ability to visually confirm the skills. They appreciated the potential for video to demonstrate oral communication skills and performance tasks.

What I challenge...is how much did the student contribute to a specific project...What was his true contribution to those projects?...It’s better when you know upfront where they’re at and that ability to work with teams, how much they contribute, how they engage and contribute and that’s hard to get from a résumé. (Donald)

These examples need to be very thorough. It is not enough to just show a bunch of pictures (Fowler, 2012, p. 151).

It could be something that’s really, really neat and even if they wanted to put the video around some of their competencies...That way we can hear tone. (Laura)

[The] third thing I would click on would be just to hear them talk, hear them converse (Fowler, 2012, p. 148).

Encapsulate Traditional Materials and Online Media

Engineering employers appreciated the ability of the ePortfolio to encapsulate the traditional application materials with online resources. They were pleased that the Engineering Student’s ePortfolio was accessible and easy to navigate from page-to-page. When Fowler presented his template to members of his peer debriefing team, they stated
the usefulness of the tool is dependent “on the interrelation of the information the user
can seamlessly access” (Fowler, 2012, p. 165).

In short, participants from both studies believed an ePortfolio must be well
organized and easy to access to be effective. Employers appreciated the portability of the
ePortfolio, and would access the ePortfolio from a link on an applicant’s résumé. In
addition, participants from both studies appreciated ePortfolios for their ability to link to
additional, interrelated information. Fowler argued that the ePortfolio could advance
connections between data components and artifacts for the user. The engineering
employers expressed an interest in the ability of the ePortfolio to link and connect with
other professional social media outlets and online resources.

Assess Potential Fit and Future with Company

Participants in both studies agreed a candidate’s soft skills, personality, and
potential “fit” with an organization are integral components to the hiring process. These
soft skills can include teamwork, critical thinking, problem solving, communication, and
service. Participants from both studies agreed these traits could be challenging to
demonstrate via a résumé. The employers in both studies wished to learn about a
candidate’s experiences and personality. In Fowler’s study, “Not one participant in the
manufacturing or service sector mentioned the use of a resume [sic] or an application in
authenticating the soft skills that they placed such great emphasis upon during the
interview process” (Fowler, 2012, p. 97). This is a factual statement for the employers in
the engineering sector as well. The employers in both studies relied on the interviews to
address these soft skills. Many participants in the present study appreciated the ePortfolio
for this reason; the prevailing viewpoint was that the tool would be helpful before or after an interview.

Fowler’s employers were seeking evidence of an applicant’s goals and future plans. Similarly, the participants for the present study were interested in assessing a candidate’s long-term potential. Participants from both studies expressed a desire for a candidate who is a lifelong learner or exhibits an ability to learn. The employers agreed one way these attributes could be showcased in an ePortfolio is through recommendations. For instance, in Fowler’s study, a senior manager in healthcare suggested to candidates that they ask patients to provide testimonials of their care. In the present study, Donald suggested candidates include references from professors within their ePortfolios.

**Differences in the Two Studies**

Clearly there were commonalities among participants in both studies. However, there were also differences within their responses. They disagreed on the inherent merits of the résumé, when they would use the ePortfolio and how it might affect the timing of the hiring process, and the use of an ePortfolio as proof of job-related or technical skills and as a means of saving money.

**Merits of the Résumé**

The engineering employers all appreciated the résumé as an adequate pre-screening tool, and did not express a desire to replace it in the hiring process. They relied on the résumé for its concise length, portability, accessibility, and placement as the industry standard. Many perceived adding an ePortfolio to their initial screening process as additional work. In contrast, Fowler’s participants expressed a frustration with the shortcomings of the résumé, which included lack of information, inaccuracies, and the
inability to validate skills (Fowler, 2012, p. 91). Fowler’s participants felt that relying on
a résumé could be a guessing game for employers.

Despite the fact Fowler’s employers disagreed with the present study’s employers
on the effectiveness of résumés, participants in both studies will continue to rely on
résumés. In addition, they will all likely review the résumé first when viewing an
ePortfolio. Fowler stated:

The ePortfolio will not replace the resume [sic] or application, as human resource
professionals will continue to use them in their processes. (p. 189)

Participants also indicated the resume [sic] to be the item within an ePortfolio
they were most likely to view first. This comfort level with the traditional resume
[sic] was based on the familiarity with its structure and information after years of
use. (p. 195)

**Using ePortfolios in Hiring Process and Affect on Time**

The present study found that introducing an ePortfolio into the hiring process
would provide an employer with more information. This supports Fowler’s (2012) study;
he found that using an ePortfolio enhances the quality and quantity of information
received during the pre-screening process. The difference in the two studies is when the
ePortfolio would be used in the hiring process. Fowler’s participants found it useful in the
pre-employment screening. Although some engineering employers would use the tool for
the pre-screening, many of the engineering employers would use the tool prior to an
interview or after the interview process.

Participants from both studies expressed a concern with the overall efficiency of
the hiring process. Nine out of 12 of Fowler’s participants believed that using an
ePortfolio saves time in the interview process (Fowler, 2012, p. 108). It can eliminate one or two steps or consolidate steps within the hiring timeline. In contrast, the participants in the present study were conflicted whether using an ePortfolio would add or save time in the overall process. Nevertheless, all engineering employers would review or use the Engineering Student’s ePortfolio in their hiring process. This means that whether they believed it would save time or add time, they considered the ePortfolio to have value.

**Proof of Job-Related Skills**

Authenticating job-related skills was a recurring theme among the employers in Fowler’s (2012) study. “The need to validate an applicant’s skill level at an early point in the process was clear in the study” (Fowler, 2012, p. 95). This was not a dominant theme in the present study. One reason for this discrepancy could be that all engineering employers were recruited through the University in Southeast Texas. They also viewed the Engineering Student’s ePortfolio, an individual who had completed a bachelor's degree. There was likely an assumption by the participants that the ePortfolios in question would all be from applicants who had completed bachelor’s degrees. The participants may have assumed the (hypothetical) applicants with ePortfolios would have already completed the prerequisite coursework needed to perform the job.

**Saving Money**

The majority of Fowler’s participants believed that using ePortfolios saved them money because of the efficiency in using the websites within their hiring process. This was not a sentiment expressed by the participants within the present study. It is certainly possible the tool could save companies money if the ePortfolio were structured to address
the competencies employers were seeking from candidates. Nonetheless, saving money through ePortfolio usage was not mentioned by any of the engineering participants.

**Comparing Essential Criteria from Fowler (2012) with Present Study**

Fowler’s (2012) analysis revealed that his employers found evidence of soft skills and tangible skills useful and necessary to include within an ePortfolio. As a result of his findings, he developed recommended templates for both the nursing and manufacturing disciplines. He divided his templates by soft skills and tangible skills. Although this study does not suggest a specific template for the engineering sector, the researcher does recommend essential criteria for engineering students to include when creating ePortfolios (see Essential Criteria for Engineering Students’ ePortfolios). The essential criteria for engineering students both compare and contrast with Fowler’s findings.

**Similarities in Criteria between Two Studies**

As previously mentioned, Fowler (2012) divided his templates into two distinct sectors—manufacturing and nursing—and then separated the templates by soft skills and tangible skills. Fowler recommended the following sections to demonstrate soft skills: (1) About Me, (2) Experience, and (3) Communication. The findings of the present study produced similar results. Employers in both studies expressed an interest in learning more about a candidate to better inform their decision-making process. The traits they were seeking included an applicant’s goals, initiative, and commitment to service. Employers within both studies also appreciated content pertaining to professional experiences when evaluating a candidate’s ePortfolio.

Strong written and oral communication skills were valued within both studies. For instance, in Fowler’s study, he explained that nursing managers seek care plans from
candidates as a means of assessing their ability to write. Similarly, some participants in the present study appreciated reviewing the Engineering Student’s thesis. Participants in both studies also valued candidates who express themselves effectively through video, either by filming themselves, or through sharing videos that showcase their skills and aptitude for designing novel products.

**Differences in Criteria between Two Studies**

The essential criteria for engineering students building ePortfolios differ in regards to Fowler’s templates for tangible skills. For instance, Fowler included Transcripts and Certificates and Licenses as recommended sections. The participants in the present study felt that a listing of coursework was rarely needed, and licenses were not mentioned at all. One reason for the contrasting results pertaining to tangible skills is that Fowler’s templates were specific to the nursing and manufacturing fields, and therefore not as relevant for the engineering sector. Another plausible reason for the contrasting results is the difference in the research design between the two studies. Fowler’s participants provided their feedback on ePortfolios based upon their experiences in using the tool in a real world setting. Most of the participants in the present study shared their perceptions of ePortfolios based upon the one Engineering Student’s ePortfolio they viewed. Several participants had never seen an ePortfolio prior to their involvement in the study. Therefore their feedback on each section within the Engineering Student’s ePortfolio was limited to this one particular website’s organization and content.
Comparing Findings from Hartwick and Mason (2014) with Present Study

Hartwick and Mason (2014) conducted a qualitative study analyzing principals’ reactions to introductory videos within ePortfolios, and how ePortfolios might be created so they are more useful to employers. Some of their interview questions were used for the present study (see Appendix A). Hartwick and Mason found that an employer would likely use an introductory video within an ePortfolio, and the video drew the principals in by allowing them to virtually connect with a candidate.

There were similarities in the findings between the Hartwick and Mason (2014) study and the present study. The introductory videos were well received in Hartwick and Mason’s study, and videos were a component that several participants in the present study requested, even though videos were not present in the Engineering Student’s ePortfolio. Laura in particular believed an introductory video would be a welcomed addition to an ePortfolio. Participants in the Hartwick and Mason study cited time as a barrier in reviewing candidates’ ePortfolios. In the present study, an expressed concern was that too much information could be presented to employers, and they would not use the tool. The participants from both studies were also in agreement that ePortfolios were valuable in regards to their convenience, accessibility, and portability. The majority of Hartwick and Mason’s 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. Finally, the participants in both studies appreciated the ePortfolio for its ability to differentiate candidates and assess communication skills.

\[ \text{When it’s time to decide between you and another candidate, now I want to know everything I can know about you. That’s when I will really sit down and look at} \]
this, every single page and by every page; I mean I would read every word.

(Elizabeth)

You are down to the two candidates. So now you’re thinking, I am going to read this because I am looking for reasons not to hire this person (Hartwick & Mason, 2014, p. 177).

**Essential Criteria for Engineering Students’ ePortfolios**

There are 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 (1) an executive summary, (2) an accessible résumé, (3) an about me page, (4) academic and professional experiences and projects, (5) research, leadership, and service information, and (6) references. As a result, the researcher recommends the following essential criteria for an engineering student developing an ePortfolio:

1. **“Home Page”**—includes an executive summary of the student, such as the student’s name, major, university, contact information, other relevant academic information, and any other professional and academic websites or social media sites;

2. **“Résumé”**—should be easy to find, access and print;

3. **“About Me”**—personal bio on student that may or may not include photos;

4. **“Academic Experience and Projects”**—evidence of student’s work in courses and scholastic work outside the classroom; might include images, presentations, diagrams, charts, and audio and video files;
(5) **Professional Experience and Projects**—evidence of student’s work for a company or internship; might include images, presentations, diagrams, charts, and audio and video files;

(6) **Research**—description of research conducted (if applicable for student); might include research posters, images, presentations, diagrams, charts, and audio and video files;

(7) **Leadership**—evidence of leadership experiences both on and off campus (if applicable for student); might include images, presentations, diagrams, charts, and audio and video files;

(8) **Service and/or Teamwork**—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

(9) **References**—includes quotes or letters from professors and employers.

These guidelines were developed through coding and analyzing the emergent themes and subthemes expressed by the participants 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 Harwick and Mason’s (2014) findings. Figure 11 depicts an example of what an engineering student’s ePortfolio might resemble if using the criteria recommended by the researcher.
Figure 11. Diagram for essential criteria for an engineering student’s ePortfolio.
Limitations of the Study

There were limitations within the scope and design of this qualitative study. These limitations included the sample size, the participants’ affiliation with the University in Southeast Texas, the one Engineering Student’s ePortfolio the subjects reviewed, and the employers’ past experiences with ePortfolios. Nevertheless, the researcher addressed the potential subjectivities through the research protocol and throughout the research process. More information on these limitations and the ways in which the validities were addressed are explained below.

Sample Size

The sample size was narrow in scope. The findings from this study were limited to the 11 subjects who participated. The results of this study do not apply to all employers who hire engineers.

Affiliation with University

All the participants were recruited through the University in Southeast Texas. The subjects had connections with the institution. Through their relationships with the University, or their experiences in recruiting college students, they may have possessed a more pro-portfolio position.

Engineering Student’s ePortfolio

The participants’ feedback was limited to the one Engineering Student’s ePortfolio they viewed for the study. In addition, the participants were not actually considering the Engineering Student for a position within their organization. This activity of reviewing an ePortfolio was outside of their typical hiring process.
Employers’ Past Experiences with ePortfolios

Employers’ past experiences with ePortfolios might have also shaped their perspectives. Prior to the study, most employers did not know what ePortfolios were, or only had a vague idea of what they were, in regards to the hiring process (See Figure 11). Only two participants had a clear idea of what ePortfolios were prior to participating in the study—Landon and Elizabeth. Landon is the only participant who mentioned past experience in actually using the tool. Nevertheless, Landon and Elizabeth’s feedback on the Engineering Student’s ePortfolio was similar to the other nine participants.

Addressing Validity

In efforts to address issues of validity, the interviews were recorded, and the transcripts were then coded and analyzed. The same interview questions were asked of each participant, but follow up questions were asked so as not to limit other discussions that emerged. This enabled the researcher to glean insights that were distinctive to each particular participant. Observational notes were taken during the interviews, and field notes were taken after the interviews. Participants had an opportunity to review the transcripts of their interviews. The researcher also conducted a peer debriefing with a subject matter expert to confirm the emergent themes. In addition, the participants did not show indications of seeking to please the researcher; their responses appeared to be genuine and candid.

Potential Future Studies

The findings from this qualitative study on employers’ perceptions regarding an Engineering Student’s ePortfolio have paved the way for future inquiries in the field of career ePortfolios. Future analyses might include testing the essential criteria for
engineering students building ePortfolios, and changing the descriptors of the participants. 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. Finally, performing a comparative study on LinkedIn and ePortfolios would also be insightful.

Testing Essential Criteria

An obvious next step for this research study would be to garner engineering employers’ feedback on students who have built ePortfolios using the researcher’s recommended criteria detailed in this chapter. It would be useful to evaluate its effectiveness (see Essential Criteria for Engineering Students’ ePortfolios). The criteria needs to be implemented by students and evaluated by employers to assess its impact.

Descriptors of Participants

There was diversity within the ethnicities and ages represented in the study (see Participants). Regarding gender, eight of the 11 participants were male; three of the 11 participants were female. Although there was a gender imbalance, this did not appear to affect the findings. In addition, six of the 11 participants represented the field of oil and gas. This may have affected the results since the majority of the participants were accustomed to similar hiring processes. Eight of the 11 participants represented large companies; large companies can have more rigid application processes, which also could have influenced the subjects’ responses. It would be useful to learn how the findings might compare if the employers interviewed represented primarily small sized companies.

It is interesting to note that Arian, Elizabeth, Mindy, and Roberto were the most concerned with duplication of efforts—particularly in regards to LinkedIn—and potential
biases that could arise by sharing personal information online. They were among the youngest participants in the pool; their ages ranged from 36-44 years of age. This could mean that they are more in-tuned with the pros and cons of digital hiring practices. In light of this, future studies might explore further the influence of employers’ ages in online application processes.

**Different Employment Sector or Audience**

Another possible next step would be to conduct a similar examination, but on a different employment sector. Studying a field within the arts or communication, such as the fine arts, theater, architecture, or marketing and branding, would be an interesting line of inquiry given the inherently visual nature of these sectors. Conducting an analysis on a field that uses digital profiles would also be of interest. With technology ever-changing and advancing at an accelerating rate, these types of online tools for hiring will continue to emerge and evolve over time. This will cause the lines between posting information and reviewing the materials to continue to be blurred. People will continually update their online profiles and manage their digital identity whether they are actively on the job market or not. Conducting a study on a field that regularly draws from applicants using Internet sites, such as analyzing how an online recruitment company conducts its hiring practices, would inform and impact the findings from this study. Another next step would be to conduct a similar study, but the audience could be changed from employers to graduate or professional school admissions committee members.

**Comparative Analysis on LinkedIn and ePortfolios**

Finally, employers mentioned LinkedIn repeatedly throughout the interview process. For this reason, conducting a comparative study on employers’ perspectives on
LinkedIn versus ePortfolios would be a topical and compelling analysis. Analyzing the strengths and drawbacks of both tools would be helpful to students, educators, and employers.

Summary

This study, within the field of career ePortfolios, analyzed employers’ perspectives on an Engineering Student’s ePortfolio. The investigation sought to learn the advantages and disadvantages of using an ePortfolio for employment purposes, and what employers in the field of engineering might value and find worthwhile when using an ePortfolio for hiring. Through conducting a qualitative, phenomenological multiple case study, the research questions for the study were addressed. Eleven participants were interviewed, and their feedback was recorded, coded, and analyzed to decipher common themes among the participants’ responses.

The researcher found that an ePortfolio is useful to employers of engineers in differentiating a candidate, assessing potential fit and future with a company, and encapsulating a candidate’s traditional application materials and online media within one website. Disadvantages to using ePortfolios as compared to traditional application materials include duplicating efforts for the candidate and employer, presenting too much information to the employer, and unsuccessfully introducing the tool into the hiring process, particularly during the initial screening of candidates. The prevailing viewpoint of the participants was to use the ePortfolio before and after the interview stage. The employers were conflicted as to whether implementing an ePortfolio into the hiring process would save time or not. The study revealed implications for ePortfolio design,
and as a result of the findings, the researcher recommended essential criteria for engineering students to utilize when building ePortfolios.

**Conclusion**

This qualitative analysis was an invitation for the researcher to interact with employers, but it is crucial many more exchanges take place to enhance communication and understanding among educators and employers. Research within the field of career readiness creates opportunities to step outside the classroom and off campus, and connect with the greater collegiate community. 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 readiness for the workforce, creating opportunities to dialogue and collaborate is critical for understanding and future success.
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Appendix A

Interview Questions
Table A1

*Table of Interview Questions for Study.*

<table>
<thead>
<tr>
<th>Interview Questions</th>
<th>Original Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Please share with me some information about your company and your role at your company.</td>
<td>Weber, 2016</td>
</tr>
<tr>
<td>2. Which pages or sections were most interesting to you?</td>
<td>Weber, 2016</td>
</tr>
<tr>
<td>3. Which pages or sections were least interesting to you?</td>
<td>Weber, 2016</td>
</tr>
<tr>
<td>4. What do you consider to be the strengths of an ePortfolio?</td>
<td>Fowler, 2012</td>
</tr>
<tr>
<td>5. What do you consider to be the drawbacks of an ePortfolio?</td>
<td>Fowler, 2012</td>
</tr>
<tr>
<td>6. What aspects of the ePortfolio would be MOST helpful to your decision-making process?</td>
<td>Fowler, 2012</td>
</tr>
<tr>
<td>7. What aspects of the ePortfolio would be LEAST helpful to your decision-making process?</td>
<td>Fowler, 2012</td>
</tr>
<tr>
<td>8. Could you better determine the skills of a job applicant who has an ePortfolio compared to traditional candidate screening methods?</td>
<td>Fowler, 2012</td>
</tr>
<tr>
<td>Probe: In which ways can you better determine these skills?</td>
<td>Fowler, 2012</td>
</tr>
<tr>
<td>9. Do you believe an ePortfolio would make a difference in how candidates are evaluated?</td>
<td>Fowler, 2012</td>
</tr>
<tr>
<td>Probe: How would it make a difference?</td>
<td>Fowler, 2012</td>
</tr>
<tr>
<td>10. What elements would you like to see in an ePortfolio? Please describe them.</td>
<td>Fowler, 2012</td>
</tr>
<tr>
<td>11. Do you think an ePortfolio offers enough components to represent an applicant effectively?</td>
<td>Fowler, 2012</td>
</tr>
<tr>
<td>If not, what would you include?</td>
<td></td>
</tr>
<tr>
<td>12. Do you have any suggestions for improving and/or streamlining the ePortfolio?</td>
<td>Hartwick &amp; Mason, 2014</td>
</tr>
<tr>
<td>13. What guidance would you provide applicants to help them make the ideal ePortfolio?</td>
<td>Fowler, 2012</td>
</tr>
<tr>
<td>Please give some examples.</td>
<td></td>
</tr>
<tr>
<td>15. Would you use this ePortfolio, or parts of it, in the hiring process? Yes No If so, how?</td>
<td>Hartwick &amp; Mason, 2014</td>
</tr>
<tr>
<td>16. If you would use the ePortfolio, or parts of it, would you use it in any of the following ways?</td>
<td>Hartwick &amp; Mason, 2014</td>
</tr>
<tr>
<td>i. An initial screening device</td>
<td></td>
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<tr>
<td>ii. Just prior to an interview</td>
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<tr>
<td>iii. Following an interview</td>
<td></td>
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<tr>
<td>iv. And/or in another way</td>
<td></td>
</tr>
<tr>
<td>17. If you would not use the ePortfolio, why not?</td>
<td>Hartwick &amp; Mason, 2014</td>
</tr>
<tr>
<td>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.</td>
<td>Hartwick &amp; Mason, 2014</td>
</tr>
<tr>
<td>19. Approximately how much time is spent currently reviewing a candidate’s application materials?</td>
<td>Weber, 2016</td>
</tr>
<tr>
<td>20. How would introducing an ePortfolio into the process affect the time spent in reviewing a candidate’s application materials?</td>
<td>Weber, 2016</td>
</tr>
</tbody>
</table>
Appendix B

Demographic Survey
Table B1

Table of Demographic Survey Questions.

<table>
<thead>
<tr>
<th>Research Study on Engineering ePortfolios for Hiring Purposes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demographic Survey for Participants</td>
</tr>
<tr>
<td>This project has been reviewed and approved by the University of Houston Committees for the Protection of Human Subjects (713)743-9240.</td>
</tr>
</tbody>
</table>

1. Are you currently employed at an engineering company?  
   - Yes  
   - No

2. Is your company considered a small, medium, or large-sized business?  
   - Small-sized  
   - Medium-sized  
   - Large-sized

3. What field of engineering do you work in? (select all that apply)  
   - Aerospace  
   - Agricultural  
   - Automotive  
   - Biological and Biosystems  
   - Biomedical  
   - Chemical  
   - Civil  
   - Communications  
   - Computer  
   - Construction  
   - Other (please specify): __________________________
   - Electrical  
   - Electromechanical Systems  
   - Environmental  
   - Food  
   - Forestry  
   - Geological  
   - Industrial/Manufacturing  
   - Materials  
   - Mechanical  
   - Metallurgical  
   - Mineral  
   - Mining  
   - Naval  
   - Oil/Gas  
   - Petroleum  
   - Software  
   - Systems  
   - Water Resource

4. What is your current position?  
   ___________________________

5. Do you have hiring responsibilities in your current position?  
   - Yes  
   - No

6. Are you aware of your company’s screening process for employment?  
   - Yes  
   - No
7. Do you have prior experience reviewing applicants’ résumés, cover letters, and other application materials?
   - Yes
   - No

8. Do you know what an ePortfolio is?
   - Yes, I have a clear idea of what an ePortfolio is in regards to career related purposes.
   - I have a vague idea about what an ePortfolio is in regards to career related purposes.
   - No, I do not know what an ePortfolio is in regards to career related purposes.

9. Do you have prior experience in reviewing applicants’ print portfolios or ePortfolios as a step within the hiring process?
   - Yes
   - No

10. How long have you worked at your current place of employment?
   - 0-2 years
   - 3-5 years
   - 6-8 years
   - 9-11 years
   - 12-14 years
   - more than 15 years

11. How long have you had hiring responsibilities in both your current position and past positions?
   - 0-2 years
   - 3-5 years
   - 6-8 years
   - 9-11 years
   - 12-14 years
   - more than 15 years

12. What is your gender?
   - Male
   - Female

13. What is your age?

14. What is your ethnicity?
Appendix C

Committees for the Protection of Human Subjects
Committees for the Protection of Human Subjects

Protecting the privacy and confidentiality of the participants within this study is of paramount importance. This study has received the approval to be conducted from the University of Houston Division of Research’s Committees for the Protection of Human Subjects (CPHS) on August 27, 2015. More specifically, this study is approved under Category Two, Exempt Review Status. The CPHS application included information on the research questions; benefits; design; recruitment; measurement instruments, including coding and data analysis; informed consent; interview schedule and process; confidentiality and identifying information; data retention; and other relevant information pertaining to the study. The application process also required that the researcher successfully complete the Human Subject Research Social and Behavioral - Research Investigators and Graduate Students training course to be fully prepared to conduct a research study with human subjects.
Appendix D

IRB Letter
August 27, 2015

Mrs. Karen Weber
c/o Dr. Melissa Pierson
Dean, Honors College

Dear Mrs. Karen Weber,

Based upon your request for exempt status, an administrative review of your research proposal entitled "Engineering Hiring Bodies' Perceptions about a Student's ePortfolio" was conducted on August 12, 2015.

At that time, your request for exemption under Category 2 was approved pending modification of your proposed procedures/documents.

The changes you have made adequately respond to the identified contingencies. As long as you continue using procedures described in this project, you do not have to reapply for review. Any modification of this approved protocol will require review and further approval. Please contact me to ascertain the appropriate mechanism.

If you have any questions, please contact Alicia Vargas at (713) 743-9215.

Sincerely yours,

Kirstin Rochford, MPH, CIP, CPIA
Director, Research Compliance

*Approvals for exempt protocols will be valid for 5 years beyond the approval date. Approval for this project will expire August 26, 2020. If the project is completed prior to this date, a final report should be filed to close the protocol. If the project will continue after this date, you will need to reapply for approval if you wish to avoid an interruption of your data collection.

Protocol Number: 15447-EX
Appendix E

Transcript Approval Form
Transcript Approval Form  
(adapted from Fowler, 2012)  

Project Title: Engineering Employers’ Perceptions of a Student’s Electronic Portfolio  

Dear______:  

As per our discussion, I am offering you an opportunity to review the interview transcript on your perceptions on the use of a student’s ePortfolio for the hiring process. Please do not concern yourself with editing the transcript for grammar, but if you see that there are errors regarding your meaning or intent, please track changes on the attached document. Also add additional comments that you think will provide enhanced clarity. Please mark in the appropriate space below to indicate your level of approval with the transcript.  

_____ I approve of the interview transcript without reading it and have no additional comments to add.  

_____ I have read the interview transcript and approve it without changes.  

_____ I have read the interview transcript and approve it with the tracked changes and additional comments.  

_____ I do not approve of the interview transcript.  

Provided you approve the transcript, I would like your consideration of the pseudonym or general identifier that would be used to describe specific situations or statements that you have provided that may illustrate and give richer detail to the context of ePortfolios by engineering students. For this purpose, I would like to suggest pilot study participant as the pseudonym that I would use in this situation. Please mark in the appropriate space below to indicate your level of approval is using such pseudonym.  

_____ I approve the pseudonym indicated above when references are made to specific situations or statements that I have provided.  

_____ I approve the use of ________________________ (provide alternative) as the pseudonym or general identifier that would be used when references are made to specific situations or statements that I have provided.  

_____ I do not approve the use of any pseudonym.  

_____________________________  
Signature of Participant  
_____________________________  
Date  

Please return this form and the transcript, if changes were made, via email to  

kweber@uh.edu. Thank you again for offering your time and expertise to this research study.  

Karen Weber, Principal Investigator (713) 743-3367, kweber@uh.edu  
Melissa E. Pierson, Ph.D., Advisor (713) 743-4961, mpierson@uh.edu
Appendix F

Codes for Interview Transcripts
Table F1

*Table of Codes for Interview Transcripts*

<table>
<thead>
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<th>Codes</th>
<th>More Information</th>
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<td>Technology</td>
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<td></td>
<td>Team and Teamwork</td>
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<td></td>
<td>Soft Skills</td>
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<td>Research</td>
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<td></td>
<td>Succinct and Intentional</td>
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<td></td>
<td>References</td>
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<td></td>
<td>Service</td>
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<td></td>
<td>Story and Narrative</td>
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<td>Skills and Skillsets</td>
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<td>Communicating and Writing</td>
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<td>Curriculum and Relevant Courses</td>
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<td>Fit and Future</td>
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<td>LinkedIn</td>
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<td>Interview</td>
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<td>Navigation, Layout and Organization</td>
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<td>Work Experience</td>
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Appendix G

Coding Frequency and Commonalities Among Participants
Table G1

*Table of Coding Frequency and Commonalities Among Participants*

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<th>Codes</th>
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<td>About Me</td>
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<td>About Me Negative</td>
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<td>Dig and Give</td>
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<td>Executive Summary and Home</td>
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<td>Extra-curricular</td>
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<tr>
<td>Success and Interpersonal</td>
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<td>Story and Narrative</td>
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<td>Skills and Skills</td>
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