ePortfolios: Methodology to Validate and Promote Critical Workforce STEM Skills

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The ePortfolio: A Workforce Definition

On October 27, 2011, a group of faculty and students from Trenholm State Technical College attended the Oracle Academy Student Forum Day at Alabama State University in Montgomery, Alabama. The forum was presented by the regional director of the Oracle Academy. As part of the Student Forum Day, the director explained what was generally expected of students in the workplace and specifically what Oracle required for employment. In addition to these skills, the presenter informed the group about a recent event that strongly suggested ePortfolios were becoming a method of choice to validate a prospective employee's skill set—in terms of technical-skills, soft-skills, community service, and professional development. The event she alluded to was in reference to a professional position Oracle was attempting to fill from among several highly qualified job applicants.

This Oracle administrator was very interested in one particular applicant's specific skills, as listed on his standard paper resume. She informed the applicant that the written resume was not the vehicle of choice to validate actual workforce/Oracle requirements; rather, she advised the applicant to develop and present an ePortfolio that validated the actual design of a functional database. This validation included screen-shots for the Oracle database in run-time, output, design structure, coding, normalization, and other specifics that offered proof of the relational system in actual operation—items that only the Oracle relational database could generate. The qualified prospective employee, as advised, created the ePortfolio with the items mentioned to fully demonstrate and validate his repertoire of specific design skills, including other projects, community service, and academic pursuits. As an outcome of the ePortfolio—which not only validated the skills and abilities of the applicant, but also effectively marketed those skills and abilities—the applicant was offered the position with Oracle.

Indeed, the ePortfolio has begun to make significant inroads into the demonstration of skills as a method by which more and more employers are using to review a candidate's qualifications. However, a dichotomy has also arisen between a candidate's skills and the alignment of those skills to business objectives or outcomes. This contradiction between skills and job acquisition has been dubbed, "the skills gap."
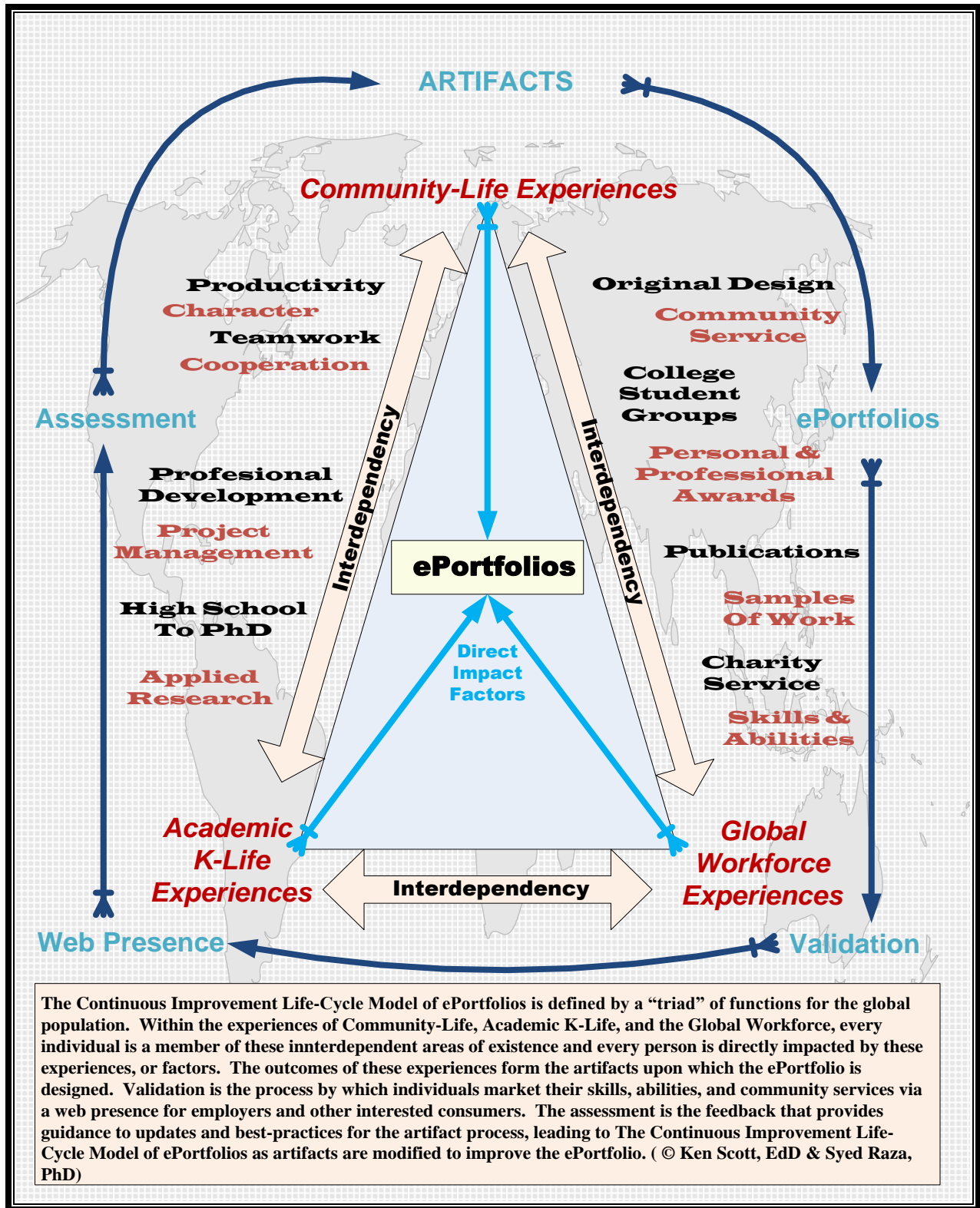
ePortfolios and the Skills Gap

The skills gap has been defined by the American Society of Training and Development (ASTD) as "a significant gap between an organization's current capabilities and the skills it needs to achieve its goals. It is the point at which an organization can no longer grow or remain competitive because it cannot fill critical jobs with employees who have the right knowledge, skills and abilities" (2009, p. 4). In order to ascertain the potential impact of the skills gap and the perception that the skills gap exists, ASTD (2009) conducted research at 1,179 organizations. Within these organizations, 79 percent reported that they acknowledged the existence of a skills gap and that it was indeed a negative determinant in their ability to "fill critical jobs with employees who have the right knowledge, skills and abilities" (p. 8).

Conversely, Peter Cappelli's book, *Why Good People Can't Get Jobs: The Skills Gap and What Companies Can Do About It* (2012), suggested that the skills gap is a much more complex issue than simply stating that organizations cannot align its competitive workforce needs to its future competitiveness within the global marketplace. He cites a major disconnect between hiring practices and the skills and experiences of the pool of applicants; moreover, he cites the critical need for the workforce and institutions of higher education to better align hiring needs with education and training, respectively. To validate and promote the skills, abilities, and experiences of employees, a methodology must become the de facto process to capture and validate these skills, abilities, and experiences; ergo, the ePortfolio.

As illustrated in Figure 1, the ePortfolio is the culmination and interdependency of a triad. Every individual essentially exists in three areas: Global Workforce, Academic K-Life, and Community-Life. We gain experiences that are important and relevant to employers; to our communities and families; and to our personal, professional, and academic development from this triad of systems. In terms of the community college system in toto, it is imperative that we not only build the workforce-to-community college alignment processes to help our students succeed long before they arrive on site to demonstrate their skills, it is equally important that we give them the tools to validate and promote their STEM and related skills to employers in the form of an ePortfolio. The ePortfolio provides the methodology and the tool to build the bridge between validating and promoting student skills, abilities, and community service, and the perceived or actual skills gap.

Penny Light, Chen, and Ittelson (2012) suggest that, "ePortfolios offer a framework within which students can personalize their learning experiences, and create different representations of their learning experiences tailored to specific audiences while also developing multimedia capabilities" (p. 9). To support this idea, Dan Schawbel (2011), suggested that within 10 years, a person's online presence will replace the standard resume. He lists five reasons for the prospect that ePortfolios will be the future resume: (1) social networking use is skyrocketing while email is plummeting; (2) it is difficult to find jobs using traditional strategies; (3) people are managing their careers as entrepreneurs; (4) the traditional resume is now virtual and easy to build; and, (5) job seeker passion has become the deciding factor in employment.

Figure 1. **Continuous Improvement Life-Cycle Model of ePortfolios**

The Continuous Improvement Life-Cycle Model of ePortfolios is defined by a "triad" of functions for the global population. Within the experiences of Community-Life, Academic K-Life, and the Global Workforce, every individual is a member of these innterdependent areas of existence and every person is directly impacted by these experiences, or factors. The outcomes of these experiences form the artifacts upon which the ePortfolio is designed. Validation is the process by which individuals market their skills, abilities, and community services via a web presence for employers and other interested consumers. The assessment is the feedback that provides guidance to updates and best-practices for the artifact process, leading to The Continuous Improvement Life-Cycle Model of ePortfolios as artifacts are modified to improve the ePortfolio. (© Ken Scott, EdD & Syed Raza, PhD)

While acknowledging that 79 percent of organizations reported a skills gap, and that it is conceivable that our online presence will become our present resume, it behooves community colleges to initiate a methodology to promote and validate student skills, abilities, and community service in a web-based format such as the ePortfolio. Moreover, this process must start within a student's first year of attendance and continue as a lifelong learning process.

ePortfolios: Design, Development, and Community College Practices

At Trenholm State Technical College, a specific course is being used to initiate the design, development, and longevity of the student/employee ePortfolio. The DPT291-Case Study in Computer Science has become a capstone course in which the design and development of the ePortfolio begins in a student's first year of attendance, conceivably their first semester. The question that might be proffered is: How can your capstone course be offered in a student's first semester? The answer is not a complex one: It is offered in the first semester because it is pay-it-forward in design. It begins when the student enters the CIS program and continues through a comprehensive exit exam and presentation in web-time of the student's professionally developed web-presence, an ePortfolio. Students are encouraged to continue their ePortfolio development after graduation and throughout their lives.

As part of the overall process to enable students to build a professional web presence, or their respective ePortfolio, DPT291 includes several aspects of design and development:

1. The overall impact a professional ePortfolio may have on students' future workforce endeavors, promotions, community service, validation of work completed, awards received, and so forth, is investigated through a review of relevant materials, research, and online applications.
2. The technical skills needed to develop a website; upload and download files; and catalog and present artifacts to promote skills, abilities, and community service are practiced in depth throughout the course.
3. Structure, personal and professional artifacts, copyright, and other issues are discussed to protect the student and the college from inadvertent misuse of rights-protected materials.
4. Applications such as DreamWeaver (CS5/6/x) and HTML5 are used to give students specific Web design and development skills that become the baseline from which they maintain their ePortfolio for the rest of their lives.
5. Marketing knowledge helps students learn to sell themselves using what they post to their websites and ePortfolios so that the skills, abilities, and community service are selling points to employers and other community stakeholders.
6. A concise, online e-resume is developed to incite interest from prospective employers.
7. Soft skills are included in the ePortfolio to demonstrate teamwork, collaboration, communication, and critical thinking as a minimum set of validated soft skills.

Although many two-year colleges may have ePortfolio classes or programs across many departments, students need some form of validation process to demonstrate the skills they bring to the workforce. Consequently, community colleges need to consider a holistic approach for all students to develop an ePortfolio as a methodology to validate and promote the skills, abilities, community service, and workforce-worthiness of our future employees.

Implications and Recommendations

To better understand the implications and recommendations specific to ePortfolio practice in the community college, the following small sampling of resources regarding ePortfolio development are provided.

1. Personal branding expert and *Forbes* author Dan Schawbel predicts that, within 10 years, résumés will be a thing of the past (2011).
2. If ePortfolios are to become platforms for gaining employment upon graduation, many members in our colleges need to make a coordinated effort to help students produce a polished, professional, and compelling online presence (Okoro, Washington, & Cardon, 2011).
3. Do we know for certain that graduating students who bring electronic portfolios to their job interviews will be more competitive than students who furnish paper-based portfolios (Kohn & Hibbitts, 2004)?
4. Virginia Tech is working to unify undergraduate experiences through the use of ePortfolio tools for the university's Quality Enhancement Plan (QEP), part of Virginia Tech's reaccreditation effort through SACS (Summers & Zaldivar, 2010).
5. ePortfolios are becoming the new standard that every person has to have; they have broken out of the educational sector and are being adopted for employees in companies (Batson, 2010).
6. ePortfolios and Faculty Development: Charting the Impact on Teaching, Learning and Campus Culture was presented at the 2011 Association for Authentic, Experiential, and Evidence-Based Learning annual conference.
7. Mahara is a fully featured, open source Web application for building electronic portfolios.
8. Clemson University has created a Web section that includes competitions for best ePortfolios.

Assuming that the skills gap is a major problem perceived by businesses, the ePortfolio is a prime tool for promoting the widest dissemination of a graduate's potential contribution to an organization. If employers are conducting searches for employees by methods such as Web searches, it is critical that students register domains and use applications from hosting sites to ensure that search engines locate them generally across the Internet and more specifically through the use of keyword logic.

A Final Word

Community colleges have long had the technologies and knowledge to initiate ePortfolio development for their students. To promote and validate student learning outcomes achieved through curricular, co-curricular, and extracurricular activities, students need a methodology to capture, catalog, and promote their artifacts across the spectrum of the triad illustrated in Figure 1. In helping a student to develop and publish a professional ePortfolio, the community college gives the student a competitive advantage by facilitating a better demonstration of the student's skills, abilities, and community service—in the same manner requested by the Oracle Academy Regional Director.

It may seem that asking students to design, develop, and maintain an ePortfolio is a major assignment requiring technical acumen and a significant time commitment. Imagine, though, that over the next 10 years the trend moves more strongly toward the online presence and away from the printed resume. If we begin early, our students will have not only their ePortfolios, but also the ability to build and maintain them. The ePortfolio readily demonstrates skills developed in college and in peripheral activities, and includes presentations of projects, teamwork, community service, writing samples, awards, work experience, original design, and many other objects that might be of value to business and industry.

DPT291-Case Study in Computer Science is a pay-it-forward student teaching-learning outcome designed to help ensure that in 10 years the students who have taken this course will have immediate and extended experience at designing and honing their ePortfolio into a truly applicable set of validated skills, as well as maximizing the marketability of their Web presence. At the very least, if the skills gap is such a critical workforce issue, the ePortfolio is a useful tool for locating skilled workers.

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