Lowenthal, P. R., White, J. W., & Cooley, K. (2009, November). Implementing electronic portfolios by beginning with student assessment. Paper presented at EDUCAUSE 2009, Denver, CO.

Implementing Electronic Portfolios by Beginning with Assessment And Evaluation Instead Of Tools and Technology

Patrick R. Lowenthal
University of Colorado Denver
CU Online / School of Education and Human Development
patrick.lowenthal@ucdenver.edu

John W. White
University of North Florida
College of Education and Human Services
j.white@unf.edu

Karen A. Cooley
Regis University
School of Education and Counseling
kcooley@regis.edu

Abstract

Electronic portfolios have become increasingly popular. The value of a portfolio, though, depends on how, when, and why students create, submit, and have their portfolios evaluated. In the following paper, we describe how we redesigned a program's assessment/evaluation plan around the use of electronic portfolios focusing on the larger assessment/evaluation framework first and the technology second.

Introduction

Portfolios have become a popular form of assessment in Teacher Education departments over the years (Strudler & Wetzel, 2005). The use of portfolios (or specifically portfolio assessment) in education began in the late 1980s (Barrett, 2007). However, they did not come into wide spread practice until the late 1990s (Barton & Collins, 1993; Wade & Yarbrough, 1996; Strudler & Wetzel, 2005). During the past ten years--in conjunction with the exponential growth of the digital age coupled with increased demands for evidence of student learning by accreditors--electronic portfolios in particular have become increasingly popular (Barrett, 2002; Penny & Kinslow, 2006; Strudler & Wetzel, 2005; Williams, Wetzel, & Wilhelm, 2004). In fact,

electronic portfolios, which we will refer to as e-portfolios throughout this paper, have been described as "higher education's new 'got to have it' tool (Cohn & Hibbitts, 2004, p. 7). Some have even gone so far to suggest that e-portfolios have the potential to change higher education significantly (Love, McKean, & Gathercoal, 2004; Treuer & Jenson, 2003). Not surprisingly, colleges and universities are rushing to find ways to use this new got have it tool. However, overall they are having mixed results with implementing e-portfolios into their programs (as suggested in Gathercoal, Love, Bryde, & McKean, 2002; Love et al., 2004).

Despite the lack of empirical evidence supporting the benefits of e-portfolios (Evans & Powell, 2007; Hartmann & Calandra, 2007; Reardon & Hartley, 2007), educators have identified a number of benefits of e-portfolios. Often one of the most notable benefits is giving teacher education students experience using and learning about computer applications (Lin, 2008; Milman & Kilbane, 2005; Wall, Higgins, Miller, & Packard, 2006). Other benefits identified include easy access and updates (Jun, Anthony, Achrazoglou, & Coghill-Behrends, 2007), promoting reflection (Lin, 2008), supporting formative assessment (Wall et al., 2006) as well as help landing a job after graduation (Strudler & Wetzel, 2005; Wetzel & Strudler, 2006) to name a few.

Therefore, regardless of the "fad" factor, there are some sound reasons for schools and colleges of education to express interest in, if not completely implement an e-portfolio system. However, implementing an e-portfolio system is easier said than done (Gathercoal et al., 2002; Love et al., 2004). And in fact, while some like Garthercoal et al. (2002) suggest implementing an e-portfolio system is easier when an academic unit already uses a paper portfolio, we have found that it can actually be harder to transition from a paper-based portfolio to an e-portfolio system than it is to start from scratch because of the assumptions and ways of doing things that faculty and staff might carry with them.

When faced with the task of converting a traditional summative paper-based portfolio to an e-portfolio, we have found that faculty and administrators often simply create an electronic version of the old paper-based portfolio (see Treuer & Jenson, 2003). We understand completely why faculty and staff might choose to do this; rather than disrupt a system that "works," faculty and staff opt to change as little as possible—in part to help maintain business as usual. However, simply creating an electronic version of a paper-based portfolio does not necessarily improve anything (as alluded to by Treuer & Jenson, 2003). That is, simply making something "electronic" by putting it on the web does not necessarily make it better (Bauerlein, 2008; Keen, 2008; Oppenheimer, 1997); in fact, at times it can even make things worse by adding additional obstacles. Further, a portfolio—whether paper-based or electronic—is only as good as the larger assessment and program evaluation framework it is situated within. That is, we contend that much of the value of a portfolio (whether electronic or not) depends on how, when, and why students create, submit, and have their portfolios evaluated.

In the following paper, we share our experience with transitioning a traditional teacher education summative paper-based portfolio to a school wide e-portfolio system. More specifically, we describe how we redesigned a teacher education programs' assessment and evaluation plan around the use of e-portfolios—using e-portfolios both as a means toward ensuring student learning as well as a means toward large-scale program evaluation—with a specific focus on the larger system of assessment and evaluation. As such, this is more of a story about how and why one school of education implemented e-portfolios, than it is a specific blue print on how to implement e-portfolios.

Background

The Teacher Education Department at a private Catholic university in the west, like many other teacher education programs, has long required teacher licensure students to complete a paper-based portfolio at the end of their program to demonstrate what they "know and are able to do." For the purpose of this paper, we will refer to this university as Catholic Western University (CWU). During this time, teacher licensure students at CWU would compile their portfolio and get it evaluated during the last semester of their program (which typically was the same time that they were completing student teaching). While many, if not all, of the faculty preferred a portfolio method of assessing student learning (as opposed to some type of exit exam), it became apparent over the years that the CWUs' portfolio system was not working as well as it could have been or even as it was intended.

Shortcomings of our Portfolio Process

It is easy in hindsight to identify why the portfolio method of assessing student learning was not working as well as it could have been. Among other things, the portfolio became more of a box on a checklist that needed to be checked off than a meaningful or effective way to assess student learning (for students as well as faculty). This is in part because of the lack of purpose (i.e., faculty at CWU were unclear whether the portfolio was meant to serve as a reflective portfolio, a summative assessment portfolio, a showcase portfolio), lack of structure (i.e., student's could wait until student teaching before they began to create their portfolio), lack of specificity (e.g., students could choose what they included in the portfolio), lack of differentiation (e.g., undergraduate and graduate, despite the focus of their license, essentially completed the "same" portfolio), and lack of consistency/reliability (e.g., expectations of faculty varied greatly about what a "proficient" artifact looked like). Due to reasons like these and many more, the portfolio system was not adequately demonstrating student learning or mastery of course content. Unfortunately, though, it took an outside entity—specifically, the Teacher Education Accreditation Council—to help the faculty at CWU recognize this. This is not as strange as it sounds, and some might even argue that this is the purpose of accreditation visits, because many other institutions begin implementing e-portfolios as a result of accreditation (Love et al., 2004).

In 2003, CWU was confronted with the reality that the majority of the public universities in the state were accredited by either the National Council for Accreditation of Teacher Education (NCATE) or the Teacher Education Accreditation Council (TEAC). During this time, none of the independent colleges and universities were nationally accredited. This was largely because historically NCATE had been the only game in town and NCATE was known to be very rigid and very expensive (Bollag, 2006; Honawar, 2007). At the same time though, nationally, entire states began to require colleges and universities to be NCATE accredited. Not surprisingly, political pressure began to mount for independent colleges and universities to seek national accreditation; as a result, CWU found itself confronted with a decision to make. Because of reasons like these, many others, and the ultimate desire to improve the quality of the CWU program—the School of Education and Counseling (SEC) at CWU chose to seek national accreditation through TEAC.

TEAC Accreditation and Self-Study as a Catalyst for Change

Faculty at CWU were attracted to TEAC, like a growing number of other universities (Bollag, 2006), largely because of their evidence and claim-driven process (as opposed to NCATE's standards-based process) (Murray, 2000). As an accelerated adult program in a Catholic University, SEC was anything but "standard." For instance, among other things, the teacher licensure students who attended CWU lived across three different western states and the majority of their coursework was taught by affiliate faculty who were practicing professionals. CWU referred to this type of accelerated program as an enterprise model (Lowenthal & White, 2009). TEAC's claim-driven and evidence-based model allowed CWU to provide evidence for the claims it already made about student learning in their programs rather than making CWU meet nationwide standards that might not apply its programs or population. This of course was easier said than done.

After meeting TEAC's eligibility requirements, faculty conducted an internal audit and began preparing their *Inquiry Brief*. An Inquiry Brief is a self-study document in which a program provides evidence that it is producing "graduates who are competent, caring, and qualified educators, and that the program has the capacity to offer quality" (TEAC, 2009, para 2). According to TEAC, "the Brief is in essence a research monograph…and should be focused on what the program faculty wants and needs to know about the program's performance" (para 3). Some examples of an Inquiry Brief are located on TEAC's website (see: http://www.teac.org/wp-content/uploads/2009/03/teac-sampler.pdf).

The faculty, administration, and staff at CWU learned a great deal during this self-study process. Through this process, they realized that the assessment process—which relied heavily on evaluating student's final paper-based summative portfolio's—was not providing reliable and valid evidence of student growth, mastery of state standards, or providing adequate data for larger program evaluation. Even before being audited by TEAC, it became clear to the faculty that they did not have enough reliable and valid data to support the claims they made about student learning in their program. It was not that the faculty lacked data; but rather, they lacked the appropriate type of data. For instance, student grades were not reliable or valid enough to support claims about student learning. Moreover, while the administration had instituted an electronic data collection system—based in part on the paper-based portfolio, it resulted in large amounts of unreliable, invalid, and ultimately unused data. Not surprisingly, after the audit, TEAC specifically pointed out weaknesses in "Evidence of valid assessment" and "Program decisions and planning based on evidence."

Faculty realized that the problem was not the lack of data but rather that the wrong type of data was being collected at the wrong times (and largely without a standard means of gathering and interpreting said data). The data that was collected was not standardized and it provided little evidence of whether or not instructors were providing similar (and quality) instruction based upon specific criteria. In short, CWU had no valid means of evaluating the quality of varied (and widely-dispersed) affiliate faculty and their courses other than grades and student satisfaction surveys (which research has shown is not an adequate measure of teaching quality). The faculty wanted and needed a means of both tracking student learning as well as assessing the standardized quality of instruction across instructors and courses.

It became increasingly clear that to meet TEAC's requirements for accreditation, a new assessment and evaluation system was required. That is, rather than simply creating an electronic version of a paper-based system or adding electronic components to a paper-based assessment system, a new system needed to be developed. This was not an easy decision to come to.

In summary, information obtained from the initial TEAC report and from a self-study prompted by the report, proved that CWU, in this new climate of assessment and evaluation, did not have the type of evidence of student learning that it thought it had and needed for national accreditation. CWU needed a new means for obtaining evidence of student learning and growth over time and a means for ensuring standardization across affiliate faculty and courses (in essence, a means of evaluating the effectiveness of course instruction based upon a universal standard).

Program Changes and Assessments

Due to the results of the Inquiry Brief and later TEAC audit, members of the Accreditation Team—that consisted primarily of a group of full-time faculty—had to make some important decisions about what they could and should change in the program. While the faculty as a whole were comfortable with scraping the old assessment system, they were not interested in making any more changes than they needed. Given this, they made some important changes to the program that will be addressed in the following pages.

Proficiencies

When confronted with the need to wipe the slate clean and start from scratch with building a reliable and valid assessment and evaluation system, faculty--following good practice—began by asking themselves, "What do students with a degree in education need to know and to be able to do?" An obvious place to begin with a question like this would be to start with any state standards or university outcomes a program might be required to meet. However, as a nontraditional teacher education program that had students spanning three different states (and therefore three different state departments of education), coupled with years of additional outcomes and elements being "added" on, the faculty found themselves struggling to ensure that students meet five different sets of outcomes.

After some careful reflection and lively discussions, the faculty came to the conclusion that trying to address and document student learning of over 90 different outcomes was actually hurting the program by contributing to faculty and student's overall dismissal of all the outcomes. That is, by trying to assess everything under the sun, the faculty were actually not able to truly assess anything meaningfully. This should not surprise anyone; this is the basic quantity vs. quality dilemma faculty regularly face.

Rather than continue striving to address 90 different outcomes, the faculty decided to synthesize the different outcomes into a short and hopefully meaningful set of Proficiencies. They produced a proficiencies table (called the "cross walk") to illustrate to each stakeholder (e.g., the three different state departments of education) how each standard and outcome is addressed. The proficiencies consist of both a core set of proficiencies that all students getting a degree in education must meet (which are called "Universal Proficiencies" and listed in Table 1) as well as a list of discipline specific proficiencies that only pertain to certain fields of study (e.g., student's seeking a license as a special education teacher have a different set of discipline specific proficiencies than student's seeking a license as a math teacher).

Discipline knowledge can be deceiving because it can change depending on the focus of a student's program and /or licensure area. For instance, the following are the discipline knowledge proficiencies for a student getting a BA or a M.Ed. with an elementary teaching

license.

- **Literacy:** The student shall be knowledgeable about student literacy development in reading, writing, speaking, viewing, and listening.
- **Math:** The student shall be knowledgeable about mathematics and mathematics instruction.
- **Standards:** The student shall be knowledgeable about strategies, planning practices, and accommodations to ensure student learning in a standards-based curriculum.
- **Classroom Management:** The student is knowledgeable about classroom practice in order to successfully manage time, communications, and record keeping procedures that will support and enhance student learning.
- **Content Knowledge:** The student is knowledgeable in their content licensure /endorsement area.

Table 1
Universal Proficiencies

Proficiency	Description
Critical Thinking:	The student will be able to gather information from observation, experience, reasoning, and/or communication, analyze that information, generate alternatives, solve problems, and evaluate the process and solution. Critical thinking is bas4ed on intellectual values that go beyond subject matter to include clarity, accuracy, precision, evidence, fairness, and multiple perspectives.
Learning Theory:	The student will have knowledge of the complex process of how people learn and will be able to apply a variety of learning theories in an educational setting.
Professionalism:	The student will have the ability to represent the teaching profession effectively by demonstrating the following characteristics: commitment to learning, adherence to ethical standards, respect for diversity, effective communication skills, effective interpersonal skills, and accountably for actions.
Assessment:	The student will understand and apply the principles of measurement, analysis, and decision making about what students know and are able to do.
Instruction:	The student will understand and use research-based strategies and techniques to facilitate student learning and to differentiate instruction based upon individual students' needs.
Technology:	The student will demonstrate understanding and appropriate applications of technology as they relate to effective instruction and to specific endorsement areas.
Values:	The student will demonstrate an understanding of democracy, ethics, moral integrity, multiculturalism, social justice, and the concept service learning.
Communication:	The student will be able to communicate effectively through speaking, writing, listening, and observing. Students will understand effective ways of talking with students and demonstrate appropriate communication skills to their students.
Discipline Knowledge:	The student will demonstrate proficiency in the specific content area(s) of their program, licensure and/or endorsement area.

Discipline knowledge proficiencies were created for each of the different teacher licensure areas. Eventually, CWU plans to identify discipline proficiencies for each of the non-teacher licensure areas (e.g., Curriculum, Instruction, Assessment; Teacher Leadership); however, the first phase of the "remake/remodel" focused solely on the teacher licensure programs.

After the Universal Proficiencies and Discipline Proficiencies were created for each licensure program, the faculty reviewed the curriculum to identify what courses and assignments best addressed the proficiencies. That is, the faculty mapped the proficiencies to the curriculum. While the majority of the proficiencies were easily mapped to courses and assignments, there were some instances where the curriculum had to be updated to address certain proficiencies.

The faculty ultimately hoped that by identifying fewer program outcomes and mapping those directly to specific course and assignments, faculty and students should be better able to focus on addressing each proficiency in more depth.

The Gate System

But the heart of the foundation of this new assessment and evaluation system begins and ends with a Gate System—which would not be possible without utilizing an e-portfolio, given the accelerated nature of the program and the geographic dispersion of the faculty and students. The following pages specifically focus on describing the Gate System CWU developed and the role on-going assessment, gates, and gatekeepers play in making this system work.

On-going Assessment

The Teacher Education faculty decided to change the portfolio development and review process. Rather than creating a cumulative and largely *post-hoc* portfolio in the final courses of the program, students begin contributing to their portfolio during their first Teacher Education courses and build on it throughout their time in the program.

The proficiencies, as mentioned earlier, were not only mapped to specific courses but also specific assignments were identified in specific courses that meet the proficiencies. Students are then required to complete the assignments aligned with the proficiencies and include them in their portfolio. These assignments that students are required to included in their portfolio—also referred to as required artifacts—were chosen based upon the focus of each course (and its alignment to the proficiencies). Further, each proficiency was intentionally designed to be addressed and assessed at least twice in each student's program (thus providing a means of demonstrating growth/learning over time).

Rubrics were created for each of the required artifacts and are accessible via CWU's website by teachers and students (each course module and syllabus has a direct link to the proficiencies and the rubrics used for assessing each artifact). Faculty (at the course level) are expected to use the rubrics to assess the student's artifacts. These faculty have been and will continue to be trained in the use of the rubrics. Then yearly the accumulated data will be evaluated to ensure the reliability of the rubrics as measurement tools (to check for variance in inter-rater reliability).

After receiving feedback on the original assignment (from their instructor), students have the opportunity to improve upon the artifact before adding it as an artifact to their e-portfolio. This enables students the ability to improve their artifacts prior to submitting them for review in their portfolios.

Student's are reminded of this requirement in a number of different ways. First, assignments designated as artifacts for the portfolio process are clearly identified in the student learning

module and faculty syllabi. Second, students are informed of the portfolio/assessment program during their initial orientation. Third, faculty remind students which assignments must be submitted as artifacts (and therefore subsequently reviewed by independent gatekeepers) throughout each course.

Gates

Though students can upload their artifacts to their e-portfolios at their own discretion, they are required to submit their portfolio for review at certain stages or "gates" in the program in order to continue in the program. The gates serve a few purposes. First, they provide students with a clear incentive to begin creating their portfolio in their very first course. Second, they provide students an opportunity to have an independent reviewer review their work for evidence of student learning. Third, the gates provide faculty, students, and staff and opportunity to ensure that every student has demonstrated that he or she has learned the required skills and dispositions to proceed in the program. The hope is that this will limit the need to pull students from student teaching or council them out of the program—a continual problem teacher educators are faced with.

There are 2-3 gates throughout each program (see Figure 1 and Figure 2 as examples). When a student is ready to submit his or her portfolio for review, he or she will notify the Gate Keeper Coordinator. The Gate Keeper Coordinator then assigns an independent reviewer (a faculty member called a "Gatekeeper" which is described in the following section) to review and evaluate the portfolio. The Gatekeeper uses a standardized rubric to assess the individual artifacts and to generate a cumulative score for a student's portfolio to determine whether the student has met a given standard level of knowledge and performance (appropriate to the student's stage in the program) and thus whether or not he or she will be permitted to continue on to the next phase of the program. Specific feedback on the strengths and weaknesses of each artifact and the quality of the portfolio (as it stands at each gate) is given to the students after the evaluation is completed at each gate.

If upon first review a students' portfolio does not meet a minimum numerical aggregate score, the student is notified of the failing score, with specific feedback (a copy of the evaluation rubric with evaluator comments), and provided an opportunity to correct errors, weaknesses, etc. (which is referred to as the remediation plan) and resubmit the portfolio for a second review. If, however, a student's portfolio fails a second review by a second gatekeeper, the student can be removed from the program. Student's can also be placed on a remediation plan as the result of negative professional dispositions. Students reaching this point—either because their portfolio failed to pass the gate two times in a row or because of negative dispositions—may appeal a decision to be removed from the program to the faculty appropriate to their area/level (undergraduate or graduate) (see Figure 3 for a diagram of the remediation process).

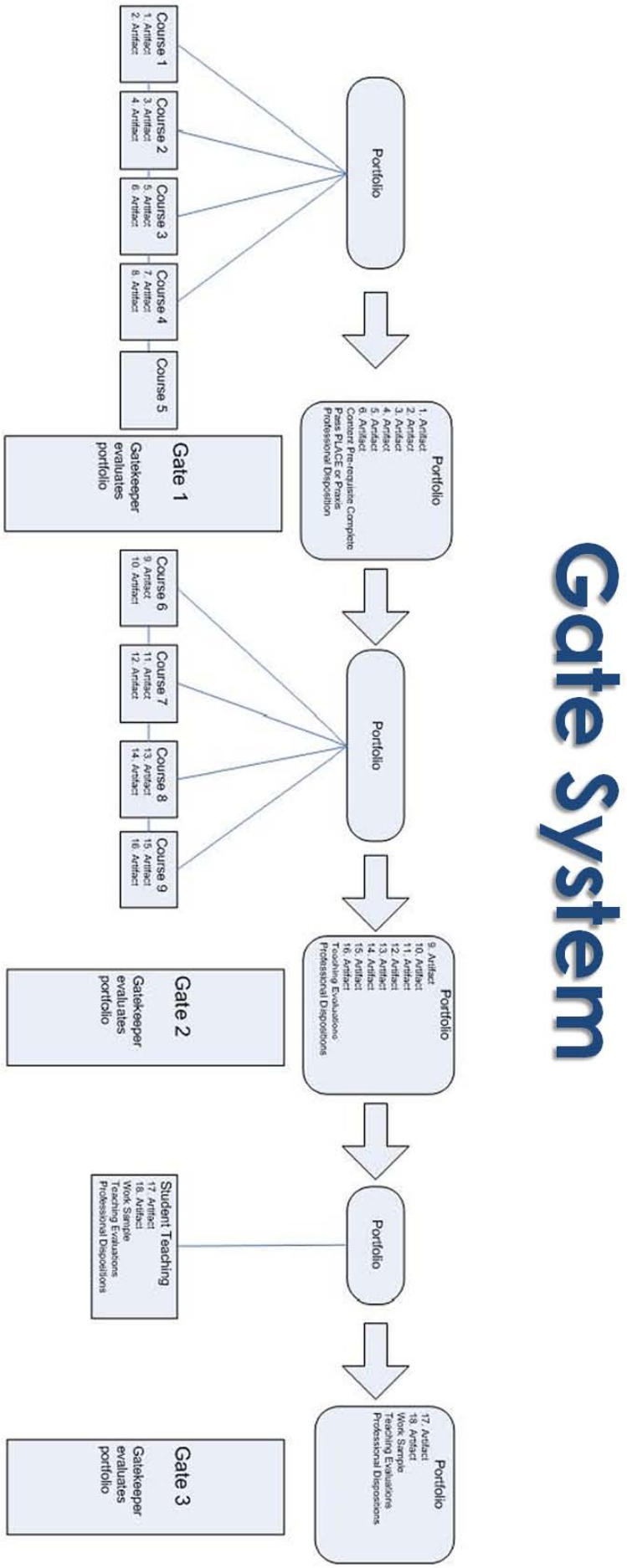

Figure 1. Macro View of the Gate System

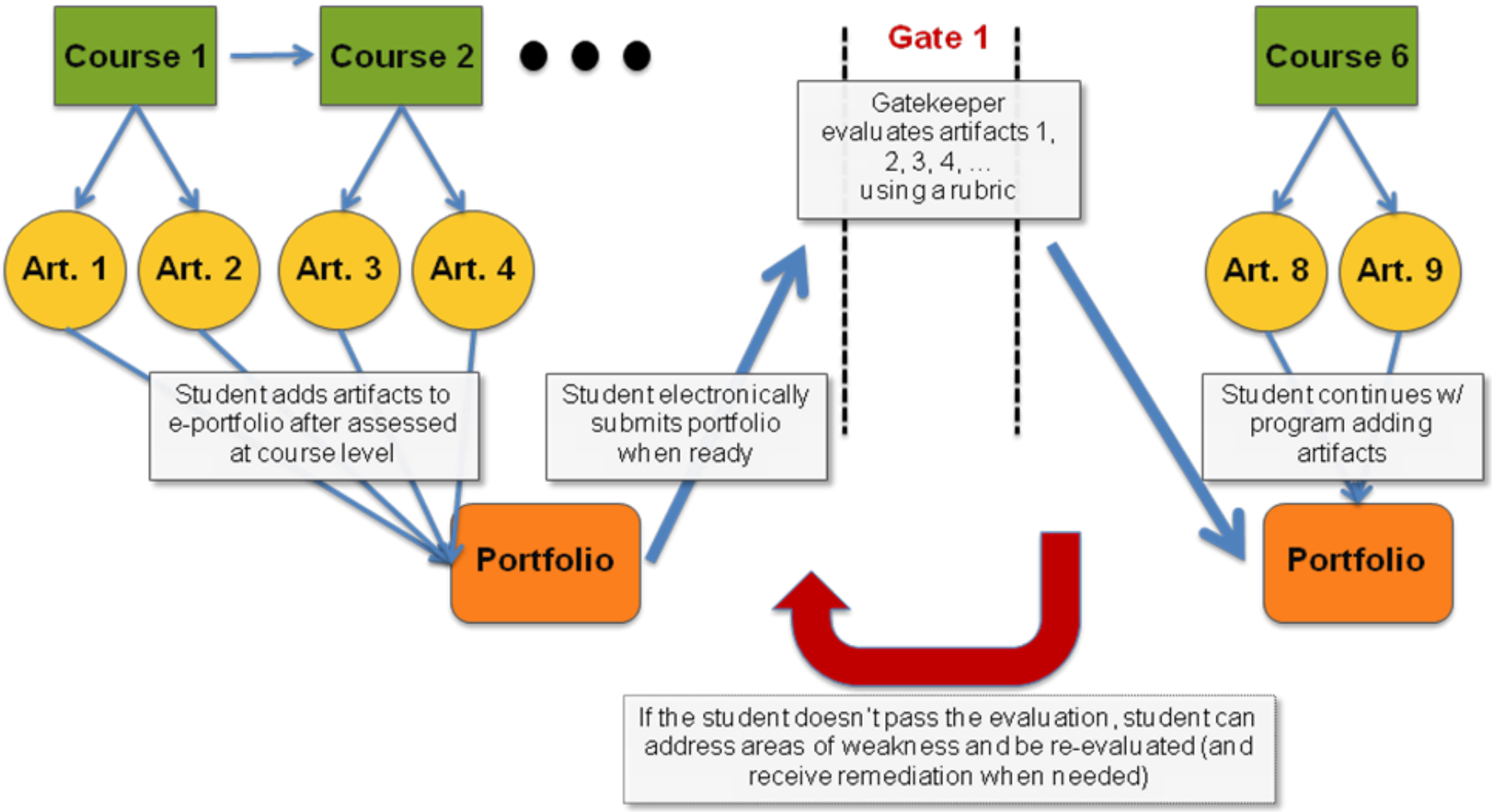

Figure 2. Micro View of a Gate

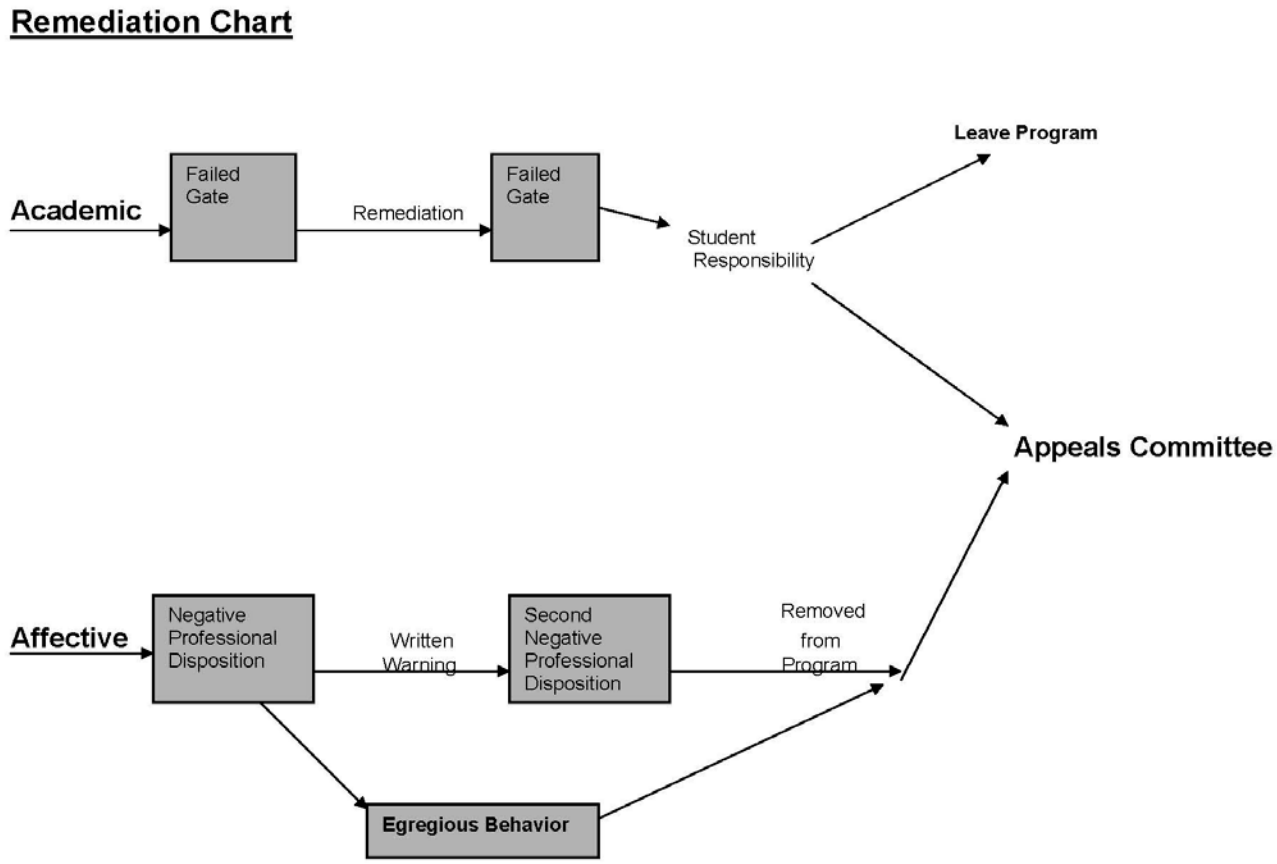

Figure 3. Remediation Plan

Gatekeepers

Gatekeepers consist of current faculty members (primarily affiliate faculty members) who have expertise in specific areas related to the gates as well as a willingness to serve in the role of a portfolio evaluator (i.e., someone responsible for assessing student portfolios). Gatekeepers assess student portfolios for pre-determined content using a standardized rubric as mentioned in the previous section. The rubric's are completed electronically for each portfolio so that the results are stored in a central database that can later be mined for reports and faculty, course, and program evaluation. Trainings, to improve inter-rater reliability, are conducted for the Gate Keepers during each semester of the academic year. Gatekeepers will also be periodically assessed for consistency of reviews—which includes comparing their ratings and feedback to other gatekeepers. Students may submit a completed e-portfolio to the Gate Keeper Coordinator for review at any time throughout each 8-week term and expect a two week turn-around review time.

Qualifications to be a gatekeeper include (a) relevant degree (a minimum of a Masters degree), (b) relevant teaching experience in the K-12 setting, (c) training to be a gatekeeper and in the use of rubrics, (d) ability to commit to timely feedback on each portfolio. Gatekeepers are then paid a set fee for each portfolio they review.

Electronic Portfolios

All of the programs in the School of Education and Counseling at CWU are accelerated programs that are offered year round. The academic year consists of six 8-week terms. In addition to the accelerated nature of the program, the teacher licensure students in the program are also dispersed across three western states—taking courses either online, independent study, or face-to-face (and often a combination of the three). Therefore, it was essential to find a way for students to complete a portfolio and submit it for review in a timely and efficient manner. An e-portfolio enables students to upload their artifacts to the e-portfolio system at the end of each course and then to submit their portfolio for review. It also keeps a digital record over time for assessment, evaluation, and accreditation purposes.

Students at CWU are required to purchase an *iWebfolio* account (for a price of $35 per year) before their first course (see http://www.iwebfolio.com). Faculty identified a preferred first course for each program. In this course, students are oriented to the portfolio review process and *iWebfolio*. There are also workshops on how to use *iWebfolio* each semester at CWU's Education Seminar's (which students are required to attend). It is important to note though that despite the benefits of *iWebfolio*, the larger assessment and evaluation system was designed to be able to work with nearly any e-portfolio application.

Program, Faculty, and Course Evaluation

The gate system and the larger e-portfolio were also designed to enable CWU's administrators the ability to look for trends when students do very well with a certain artifact (and therefore a certain course and faculty member) and similarly when students do not perform well on a certain artifact. Not only does this data provide a means of assessing student learning and performance, it also provides a means for gauging faculty and course effectiveness (including such things as grade inflation).

Research has shown that student achievement is directly related to teacher quality (Darling-Hammond, 2000). In the past, faculty members have been assessed through a college-wide initial faculty assessment (which, because of its brevity, its lack of being authentic to the real classroom teaching environment, and because it is a pre-assessment of teaching ability has proven to be inadequate for gauging faculty effectiveness) and through end of course evaluations. But through the systematic collection of student assessment data, faculty—and specifically teacher quality—can now be evaluated in a way like never before.

Data on student performance can be cross-referenced against instructors for the course from which artifacts were created. This means that, if we begin to notice poor student performance on a given artifact, we can determine if said artifacts are originating in courses taught by specific instructors. Such a finding would suggest that the instructor is failing to teach the content of the artifact sufficiently and that changes in personnel or instructional practices are needed. If, however, administrators discover that students across instructors are performing poorly on a given artifact, they can assess the appropriateness of the chosen artifact to the course content, whether or not specific content is being addressed in the course as a whole, whether or not instructors are following the module (the model course syllabus), as well as whether or not the artifact chosen for said course or course format needs to be revised.

At the same time, annually data will be collected on how each gatekeeper's rate each artifact individually at each gate. By disaggregating this data, the assessment system provides feedback on inter-rater reliability among gatekeepers and helps CWU determine if changes in gatekeepers,

their training, or the rubrics is needed.

Conclusion and Future Trends

This assessment and evaluation system—which is built upon the concept of gates, gate keepers, and the electronic storage and dissemination of artifacts—is still in its infancy. In fact, this new system was officially started less than a year ago. Therefore, in way ways it is too soon to assess its effectiveness. However, initial results suggest that overall it is working just as designed. Over time though, it is assumed that courses will need to be updated, artifacts and rubrics improved, as well as continual tweaking to the management of the entire system.

Future trends for the improvement of the system include changing/adding to/eliminating some of the present artifact assignments that will be uploaded into the e-portfolio. That is, while the overall number one purpose of this assessment and evaluation system is to more effectively assess student learning at different stages (i.e., gates) of each student's program and ultimately to prepare the best teachers possible, the faculty at CWU want to ensure that the workload involved in the day-to-day operation of this system remains realistic and manageable. Therefore, just as components can be added and adapted as needed, overtime certain things might be dropped if found unnecessary.

References

Bauerlein, M. (2008). *The dumbest generation: How the digital age stupefies young Americans and jeopardizes our future (Or, don't trust anyone under 30).* New York: Penguin Group.

Barrett, H. C., (2007). Researching electronic portfolios and learner engagement: The REFLECT initiative. *Journal of Adolescent & Adult Literacy, 50*(6), 436-449.

Bartlett, A. (2002). Preparing preservice teachers to implement performance assessment and technology through electronic portfolios. *Action in Teacher Education, 24*(1), 90–97.

Barton, J., & Collins, A. (1993). Portfolios in Teacher Education. *Journal of Teacher Education, 44*, 200-210.

Bollag, B. (2006). New accreditor gains ground in teacher education (teacher education accreditation council). *The Chronicle of Higher Education, 53*(5), A27.

Cohn, E. R., & Hibbitts, B. J. (2004). Beyond the electronic portfolio: A lifetime personal web space. *Educause Quarterly, 27*(4), 7-10.

Darling-Hammond, L. (2000). Teacher quality and student achievement: A review of state policy evidence. *Education Policy Analysis Archives, 8(1).* Retrieved from, http://epaa.asu.edu/epaa/v8n1/

Evans, M. A., & Powell, A. (2007). Conceptual and practical issues related to the design for and sustainability of communities of practice: the case of e-portfolio use in preservice teacher training. *Technology, Pedagogy, and Education, 16(*2), 199-214.

Gathercoal, P., Love, D., Bryde, B., & McKean, G. (2002). On implementing Web-based electronic portfolios. *Educause Quarterly, 25*(2), 29-37.

Hartmann, C., & Calandra, B. (2007). Diffusion and reinvention of ePortfolio design practices as a catalyst for teacher learning. *Technology, Pedagogy, and Education, 16*(1), 77-93.

Honawar, V. (2007, March 7). Teacher-college group presses for single accrediting body.

Education Week, 26(26). Retrieved from http://www.nctq.org/nctq/research/1175272882368.pdf

Jun, M-K., Anthony, R., Achrazoglou, J., Coghill-Behrends, W. (2007). Using ePortfolio for the assessment and professional development of newly hired teachers. *TechTrends, 51*(4), 45-50.

Keen, A. (2008). T*he cult of the amateur: How blogs, MySpace, YouTube, and the rest of today's user-generated media are destroying our economy, our culture, and our values*. New York: Doubleday.

Lin, Q. (2008). Preservice teachers' learning experiences of constructing e-portfolios online. *Internet and Higher Education, 11*(3-4), 194-200.

Lowenthal, P. R., & White, J. W. (2009). Enterprise model. In P. Rogers, G. Berg, J. Boettcher, C. Howard, L. Justice, & K. Schenk (Eds.), Encyclopedia of distance and online learning (2nd ed., pp. 932-936). Hershey, PA: IGI Global.

Love, D., McKean, G., & Gathercoal, P. (2004). Portfolios to Webfolios and beyond: Levels of maturation. *Educause Quarterly, 27*(2), 24-37.

Milman, N.B., & Kilbane, C.R. (2005). Directions in electronic portfolio development. *Canadian Journal of Learning and Technology, 31*, Retrieved October 5, 2006, from http://www.cjlt.ca/content/vol31.3/milman.html

Murray, F. B. (2000). The Role of Accreditation Reform in Teacher Education. *Educational Policy, 14*(1), 40-59.

Oppenheimer, T. (1997). The computer delusion. *Atlantic Monthly, 280*(1), 45-62.

Penny, C., & Kinslow, J. (2006). Faculty perceptions of electronic portfolios in a teacher education program. C*ontemporary Issues in Technology and Teacher Education, 6*(4), 418-435.

Reardon, R.C., & Hartley, S.L. (2007). Program evaluation of e-portfolios. *New Directions for Student Services*, (119), 83-97.

Strudler, N., & Wetzel, K. (2005). The diffusion of electronic portfolios in teacher education: issues of initiation and implementation. *Journal of Research on Technology in Education*, 411-433.

Treuer, P., & Jenson, J. D. (2003). Electronic portfolios need standards to thrive. *Educause Quarterly, 26*(2), 34-42.

Wade, R. C., & Yarbrough, D. B. (1996). Portfolios: A tool for reflective thinking in teacher education? *Teaching and Teacher Education, 12*, 1, 63-79.

Wall, K., Higgins, S., Miller, J., & Packard, N. (2006). Developing digital portfolios: Investigating how digital portfolios can facilitate pupil talk about learning. *Technology, Pedagogy, and Education, 15*(3), 261-273.

Wetzel, K., & Strudler, N. (2006). Costs and benefits of electronic portfolios in teacher education: Student voices. *Journal of Computing in Teacher Education., 22*(3), 99-108.

Williams, M., Wetzel, K. &. Wilhelm, L. (2004). Trials and tribulations of reflective practices in preservice teacher electronic portfolios. In C. Crawford, N. Davis, J. Price, & D. Willis. (Eds.). Technology and Teacher Education Annual (pp. 301–306) Norfolk, VA: Association for the Advancement of Computing in Education.