

Remake/Remodel: Using ePortfolios and a System of Gates to Improve Student Assessment and Program Evaluation

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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 and evaluation plan around the use of electronic portfolios and a system of gates focusing on the larger assessment/evaluation framework first and the technology second.

Institutions of Higher Education find themselves in an age of accountability (Alexander, 2000; Gansemer-Topf & Schuh, 2006; Welsh & Metcalf, 2003). Stakeholders such as accreditors, policymakers, alumni, parents, and students are demanding proof from institutions of higher education of quality teaching and student learning like never before (Millett, Payne, Dwyer, Stickler, & Alexiou, 2008). Increased focus has especially been placed on institutions that offer courses and programs online (Gabriel, 2010; Means, Toyama, Murphy, Bakia, & Jones, 2010; Martinez, Liu, Watson, & Bichelmeyer, 2006; Rovai, 2003) and recently there is even a push for institutions to better prepare graduates for gainful employment (Hamilton, 2010). The focus on accountability appears to be here to stay and the burden of proof lies on the shoulders of institutions of higher education to provide evidence of high quality teaching and learning. As a result, many teacher education programs have turned to portfolios to address these new accountability mandates from accreditors and other stakeholders (Fiedler, Mullen, & Finnegan, 2009).

Portfolios have become a popular form of assessment across all fields and levels of education (Brickley, Schwartz, & Suen, 2000; Chen & Black, 2010) but especially in our field—the field of teacher education (Maher & Gerbic, 2009; Strudler & Wetzel, 2005). The use of portfolios (or specifically portfolio assessment) in education began in the late 1980s (Barrett, 2007). However, the use of portfolios did not come into widespread practice until the late 1990s (Barton & Collins, 1993; Strudler & Wetzel, 2005; Wade & Yarbrough, 1996). Since that time, 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 ePortfolios 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 ePortfolios 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 “got to have it” tool—especially in this new age of accountability. Overall, though, colleges and universities are having mixed results with implementing ePortfolios into their programs (as suggested in Fielder, Mullen, & Finnegan, 2009; Gathercoal, Love, Bryde, & McKean, 2002; Love et al., 2004).

Despite the lack of empirical evidence supporting the benefits of ePortfolios (Evans & Powell, 2007; Hartmann & Calandra, 2007; Reardon & Hartley, 2007), educators have identified a number of benefits of ePortfolios. These benefits include experience using and learning about computer applications (Lin, 2008; Milman & Kilbane, 2005; Wall, Higgins, Miller, & Packard, 2006), easy access and updates to portfolios (Jun, Anthony, Achrazoglou, & Coghill-Behrends, 2007; Strudler & Wetzel, 2008), promoting reflection (Lin, 2008; Strudler & Wetzel, 2008), supporting formative assessment (Wall et al., 2006), tracking student learning and performance for accreditation and program evaluation purposes (Strudler & Wetzel, 2008), improving communication between faculty and students (Strudler & Wetzel, 2008), landing a job after graduation (Strudler & Wetzel, 2005; Ward & Moser, 2008; Wetzel & Strudler, 2006), and fostering lifelong learning (Heinrich, Bhattacharya, & Rayudu, 2007) to name a few.

Therefore, regardless of the “fad” factor, there are some sound reasons that programs, colleges, and universities express interest in, if not completely implement, an ePortfolio system. However, implementing an ePortfolio system can be challenging (Gathercoal et al., 2002; Love et al., 2004). And in fact, while some like Garthercoal et al. (2002) suggest implementing an ePortfolio system is easier when an academic unit already uses a paper portfolio, we contend that it can be harder to transition from a paper-based portfolio to an ePortfolio system than it is to start from nothing 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 ePortfolio, faculty and administrators often simply create an electronic version of the old paper-based portfolio (see Treuer & Jenson, 2003). We understand 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 the status quo. However, simply creating an electronic version of a paper-based portfolio does not necessarily improve much (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, we posit 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 (Felder, Mullen, & Finnegan, 2009). 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 redesigning a program’s assessment and evaluation plan around the use of ePortfolios—using ePortfolios both as a means toward ensuring student learning throughout a program of study (as opposed to only at the end) through the use of regular reviews as well as a means toward large-scale program evaluation. As such, this is more of a story about how and why one program turned to the use of ePortfolios to improve and document teaching and learning, than it is a specific blueprint or empirical study on how to implement ePortfolios across all contexts. However, we believe that administrators, faculty, and staff across different disciplines will find our story about redesigning our program around ePortfolios compelling and useful.

Background

Some background information is needed to better understand our unique context as well as the decisions we made along the way. We, the three authors, were working at a Teacher Education Department at a private Catholic university in a western state in the United States. For the purpose of this paper, we will refer to this university as Catholic Western University (CWU). CWU though is not a traditional university. All of the programs in the School of Education and Counseling at CWU are accelerated programs 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, through independent study, or face-to-face (and

often a combination of the three). The average student in the program is 37 years old.

Our program, like many teacher education programs, required our teacher licensure students (i.e., students preparing to get credentialed as K-12 teachers) to complete a paper-based portfolio at the end of their program to demonstrate what they “know and are able to do.”

For years, our students would compile their paper-based portfolio and have it evaluated during the last semester of their program. While we the faculty at CWU preferred a portfolio method of assessing student learning (as opposed to simply relying on course grades or some type of exit exam), it became apparent over the years that our traditional summative paper-based 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 our portfolio method of assessing student learning was not working as well as it could have been. 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 were unclear whether the portfolio was meant to serve as a reflective portfolio, a summative assessment portfolio, or a showcase portfolio), lack of structure (i.e., students could wait until their last semester before they began to create their portfolio), lack of emphasis (i.e., because students could and often did wait until their last semester to compile their portfolio, often it was rushed and simply not given enough time or focus), 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 program essentially completed the “same” portfolio), and lack of consistency/reliability (e.g., expectations of faculty varied greatly about what a “proficient” artifact looked like). As a result, the portfolio system was not adequately demonstrating student learning or mastery of course content and was not being assessed consistently and adequately at the end of the students’ programs. It took an outside entity, though, to help us recognize that our portfolio system was not working effectively. 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).

Around 2003, our program was confronted with the reality that the majority of the teacher education programs in the state were accredited by one of two teacher education accrediting bodies—the National

Council for Accreditation of Teacher Education (NCATE) or the Teacher Education Accreditation Council (TEAC). Over time, due to mounting political pressures from the State Department of Education coupled with a desire to remain competitive with other programs in the state and ultimately a desire to improve the quality of our program—we chose to seek national accreditation through TEAC.

TEAC Accreditation and Self-Study as a Catalyst for Change

We chose to seek accreditation through 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 non-traditional adult program serving three different states, our program was anything but "standard." TEAC's claim-driven and evidence-based model allows institutions to provide evidence for claims it makes about what their students know and can do rather than meet nationwide standards that might not apply to their programs or population.

After meeting TEAC's eligibility requirements, we conducted an internal audit and began preparing our *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). Everyone involved in our program learned a great deal during this self-study process. Through this process, we realized that our assessment process—which relied heavily on evaluating students' final paper-based summative portfolios—was not providing reliable and valid evidence of student growth, mastery of state standards, or adequate data for larger program evaluation. Even before being audited by TEAC, it became clear that we did not have enough reliable and valid data to support the claims we made about student learning in our program. It was not that we lacked data; rather, we lacked the appropriate type of data. For instance, student grades alone are not reliable or valid enough to support claims about student learning. Moreover, while our 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."

Through the TEAC audit, we realized (some of us faster than others) 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 we were collecting was not standardized and it provided little evidence of whether or not instructors were providing similar (and quality) instruction based upon specific criteria. TEAC helped illustrate this by getting a group of us in a room together and asking us to all assess the same exact thing. The results, as you might imagine, were not consistent. In short, we had no valid means of evaluating the quality of varied (and widely-dispersed) affiliate faculty (i.e., part-time adjunct faculty) and their courses other than grades and student satisfaction surveys (which research suggests is not an adequate measure of teaching quality). What we wanted and needed was a means of 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 because we all knew how much work a complete overhaul of our current assessment system would take. But in the end, we believed the hard work would pay off and result in more meaningful assessment and evaluation.

In summary, information obtained from our self-study and accreditation visit suggested that we did not have the type of evidence of student learning that we thought we had and needed for national accreditation. We 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.

Program Changes and Assessments

Due to the results of our self-study and accreditation visit, we had to make some important decisions about what we could and should change in the program. While we were comfortable with eliminating the old assessment system, we were not interested in making any more changes than needed. Given this, we decided to make some important changes that are addressed in the following pages.

Proficiencies

When confronted with the need to start over and build a reliable and valid assessment and evaluation system, following good practice, we began by asking, "What do students with a degree in education need to know and to be able to do?" Typically teacher educators would turn to state or national standards to

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 based 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 accountability 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.

answer a question like this. However, as a nontraditional teacher education program with students spanning three different states (and therefore three different state departments of education), three different state or national standards actually made this a very complicated question to answer. To make matters worse, in addition to three different sets of state standards, we also had years of additional outcomes being “added” on to our three sets of state standards, totaling over 90 different outcomes in all. After some careful reflection and lively discussions, we came to the conclusion that by trying to assess everything, we were actually not able to truly assess anything meaningfully. In hindsight, this is not surprising; this is the basic quantity versus quality dilemma faculty regularly face.

Rather than continue striving to address 90 different outcomes, we decided to synthesize the

different outcomes into a short and hopefully meaningful set of outcomes we decided to call “Proficiencies.” We created 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., students seeking a license as a special education teacher have a different set of discipline specific proficiencies than students seeking a license as a math teacher). Discipline knowledge proficiencies were created for each of the different teacher licensure areas.

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

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

The Gate System

Perhaps the biggest change we made was the creation of a Gate System—that is stages in each program where students must successfully pass a portfolio review to continue on in the program. A Gate System though would not have been realistically possible without utilizing an ePortfolio, 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 we developed and the role that on-going assessment, gates, a portfolio coordinator, and gatekeepers play in making this system work.

On-going assessment. One of the problems with waiting until the end of a student's program to assess what they have learned in a summative portfolio is that it is often too late to do much about it. For instance, after students have completed all of their coursework in a given program with passing grades, it becomes very difficult in our experience to hold students accountable for any gaps in their knowledge. On-going assessment provides faculty and administrators opportunities to formatively assess students' knowledge throughout their program and make adjustments as necessary. Therefore, we decided to change the portfolio development and review process to include on-going assessment. Rather than creating a cumulative and largely *post-hoc* portfolio in the final course of the program, we decided to require our students to begin contributing to their portfolio during their first courses and build on their portfolio after each course they complete.

We designed the system so that students would complete the assignments (which we refer to as "required artifacts") aligned with the proficiencies in each course and then include them in their portfolio. Further, each proficiency was intentionally designed to be addressed and assessed at least twice in each

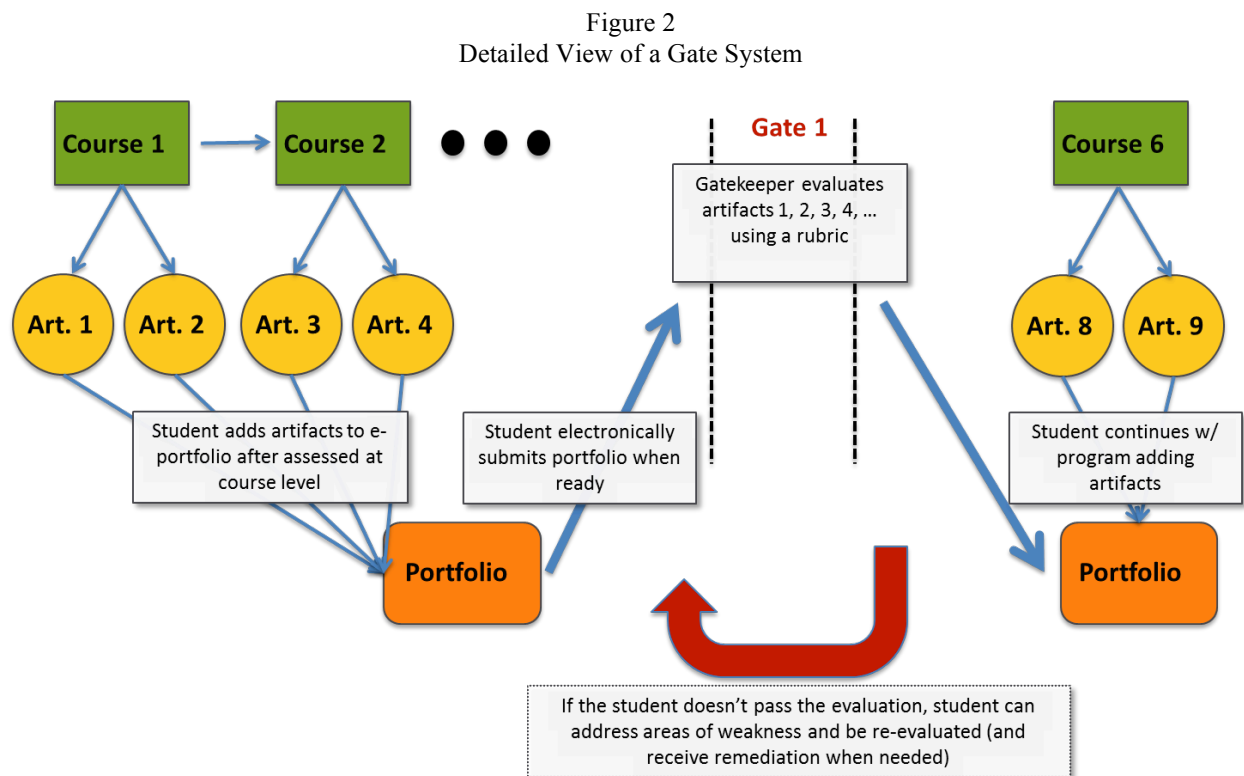
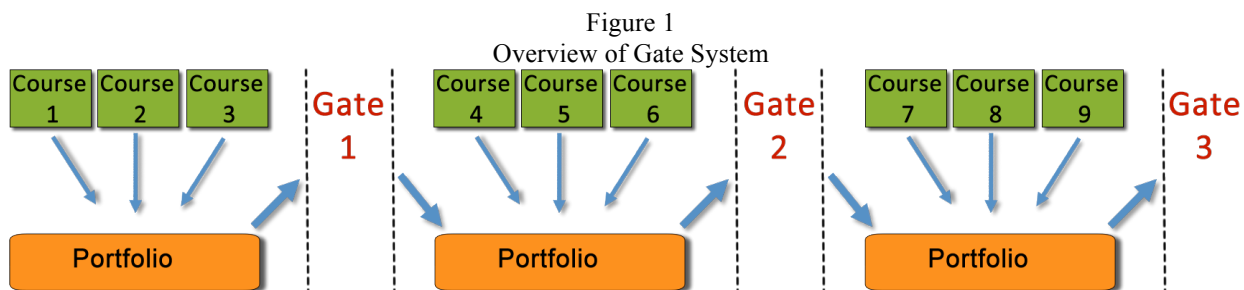
student's program (thus providing a means of demonstrating growth and learning over time).

Rubrics were created for each of the required artifacts and included in the syllabus for each course. The entire process was designed to be as transparent as possible. Faculty (at the course level) were then trained on how to use the rubrics to help ensure consistency. The system was set up so that as the required artifacts and rubrics are updated, faculty would receive additional training on how to use the rubrics. In addition, the assessment system was set up so that each year the accumulated data from the completed rubrics could be evaluated to ensure the reliability of the rubrics as measurement tools (to check for variance in inter-rater reliability).

This standardization and consistency was setup so that students could also improve upon their artifacts (after receiving feedback from their instructors) before adding it as an artifact to their ePortfolio. This provides students the ability to improve their artifacts (and evidence of learning) prior to submitting the artifacts for review in their portfolios.

Gates. A key component to making on-going assessment meaningful in our system is through the use of a gate system—that is, a series of stages or gates where students must successfully pass a portfolio review in order to continue on in their program. Gates in a portfolio system 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 (i.e., someone other than the instructor of their course) review their work for evidence of learning. Third, the gates provide faculty, students, and staff an opportunity to ensure that every student has demonstrated that he or she has learned the required skills and dispositions to proceed in the program. This becomes really important in programs like ours where students have to complete a capstone experience in a professional setting. In our field, students have to successfully complete a student teaching experience in a K-12 classroom in order to graduate. Nothing is worse than placing a student teacher in a classroom when they are not prepared or ready to be there. The gate system was intentionally designed to serve each of these purposes.

While there are a number of ways a gate system can be used, we designed our system so that each program has two-to-three gates throughout the program (see Figure 1). When students are ready to submit their portfolios for review, all they need to do is to send a request for their portfolio to be reviewed to a person designated as the Portfolio Coordinator—a staff person in charge of assigning reviewers to each portfolio.



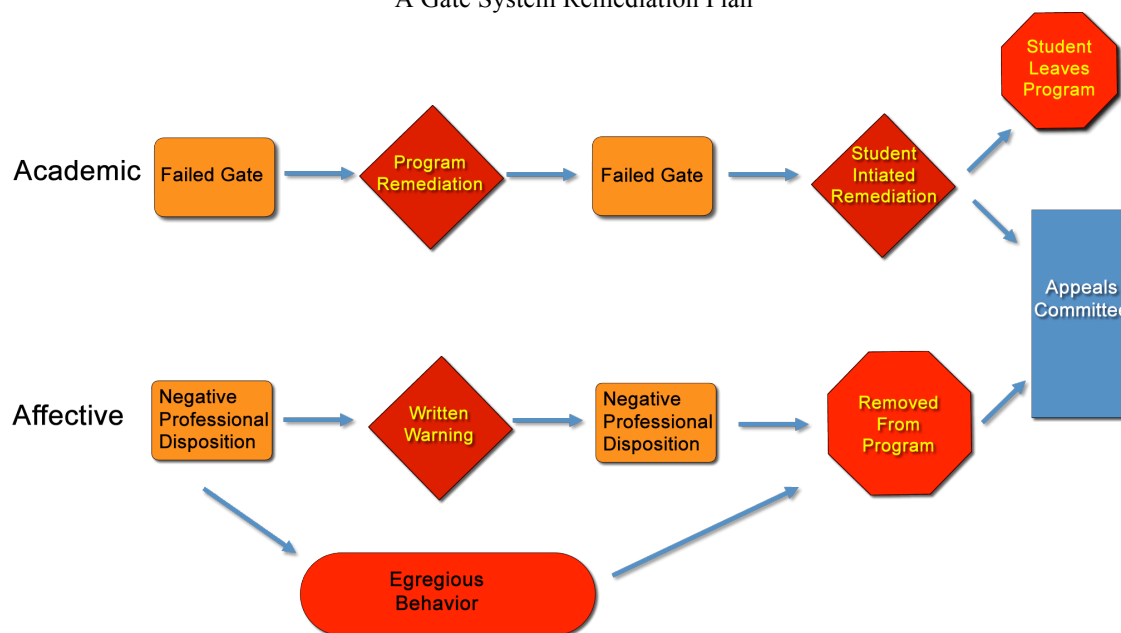
Portfolio coordinator. Faculty already feel overburdened in this age of accountability. A Portfolio Coordinator is a necessary component to a successful gate system—especially in an accelerated program like ours where students can be submitting their portfolios for review every eight weeks. Our system was set up so that once the Portfolio Coordinator receives a request for a portfolio to be reviewed, he or she then assigns an independent reviewer (a faculty member called a “Gatekeeper” which is described in the following section) to review and evaluate the portfolio and follows up to ensure that the review is completed (see Figure 2).

Gatekeepers. One of the problems we found with our previous paper-based summative portfolio process was that faculty were often biased when it came time to evaluate students’ portfolios due to prior relationships they had with the students. Therefore a key component

we designed into our assessment and evaluation system was the use of Gatekeepers. Gatekeepers are current faculty members (primarily part-time affiliate faculty members) who have expertise in specific areas related to a specific gate as well as a willingness to serve in the role of a portfolio reviewer (i.e., someone responsible for assessing student portfolios).

Gatekeepers are paid to assess student portfolios for pre-determined content using standardized rubrics in which they have been trained to use. They use a standardized rubric to assess students’ individual artifacts; the rubric helps them calculate a cumulative score for each student’s portfolio which is used 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 can continue on in the program. Specific feedback on the strengths and weaknesses of each artifact and the quality of the

Figure 3
A Gate System Remediation Plan



portfolio (as it stands at each gate) are provided to each student after review of their portfolio at each gate.

The rubrics were set up to be completed electronically for each portfolio so that the results could be stored in a central database that can later be mined for reports for accreditation visits as well as faculty, course, and program evaluation purposes. This process also enables Gatekeepers to be periodically assessed for consistency of reviews—which includes comparing their ratings and feedback to other gatekeepers.

Remediation. We recognize though that occasionally students might not pass a given gate for a variety of reasons. If upon first review a student's portfolio does not meet a minimum numerical aggregate score based on the weighted rubric, 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 (see Figure 3). If, however, a student's portfolio fails a second review by a second gatekeeper, the student can be removed from the program. Students can also be placed on a remediation plan as the result of a negative professional disposition (i.e., an evaluation completed by either a faculty member or someone in the field about a student's professional demeanor). 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.

ePortfolios

As mentioned earlier, none of this would be realistically possible given the accelerated and geographically separate nature of our programs and students in a paper-based portfolio. By requiring students to use an ePortfolio, students are able to do the following:

- begin working on their portfolio at the start of their program;
- collect artifacts (and at times iterations of artifacts) throughout their program;
- have a record of faculty assessments of their artifacts; and
- quickly submit their portfolio for review at any time throughout their program and expect a quick response.

Finally, while the ePortfolio is primarily a combination of a development and assessment portfolio, students can quickly create a showcase portfolio using artifacts of their choice later when it is time to look for a job.

Given these benefits, after reviewing a number of different tools, we selected to use iWebfolio as the ePortfolio platform for our programs. However, we believe our entire system in many ways is not dependent on any single ePortfolio platform and instead can be used with a variety of different tools. We require our students to purchase an *iWebfolio* account

before their first course (see <http://www.iwebfolio.com>). We identified a preferred first course for each program. In this first course, students are oriented to the portfolio review process and *iWebfolio*. We also provide workshops and other support materials for students year round.

Program, Faculty, and Course Evaluation

The gate system and the larger ePortfolio assessment and evaluation system was designed to enable our administrators the ability to look for trends when students do very well on a certain artifact and similarly when students do not perform well on a certain artifact. Not only can this data provide a means of assessing student learning and performance, it also can provide 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 failure to authentically represent what happens in a 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 the 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 could suggest that the instructor is failing to teach the content of the artifact sufficiently or that a change in instructional practices is 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 (i.e., the master course syllabus used by all instructors of a given course), as well as whether or not the artifact chosen for said course or course format needs to be revised.

At the same time, our system was setup to enable us to annually analyze the data collected on how each gatekeeper rates each artifact individually at each gate. By disaggregating this data, the assessment system can provide feedback on inter-rater reliability among gatekeepers and help us determine if changes in gatekeepers, their training, or the rubrics is needed.

This type of data coupled with course grades and end of course evaluations will enable us in the coming years to make data-driven decisions about what improvements need to be made in our programs and courses.

Conclusion and Future Trends

Our assessment and evaluation system—which is built upon the concept of on-going assessment, gates, gatekeepers, and the electronic storage and dissemination of artifacts in an ePortfolio—is still in its infancy. In fact, this new system was officially started about a year ago. Therefore, in many ways it is too soon to assess its effectiveness. However, initial results suggest that overall it is working just as designed. Students are working on their portfolios throughout their programs—beginning with their first course. They are also getting feedback at each gate about how they are performing and any gaps in their knowledge (based on the artifacts submitted). Over time though, it is assumed that courses will need to be updated, artifacts and rubrics improved, and the system management processes tweaked.

Future trends for the improvement of the system include changing, adding to, and eliminating some of the present artifact assignments that are required to be in each ePortfolio. 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, we 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, over time certain things might be dropped if found unnecessary.

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