

Promise and Pitfalls of Electronic Portfolios: Lessons Learned from Experience

Gloria M. Rogers
Julia Williams

Introduction

A portfolio is a "purposeful collection of student work that exhibits the student's efforts, progress, and/or achievements. The collection must include student participation in selecting contents, the criteria for selection, the criteria for judging merit, and evidence of student self-reflection."ⁱ There is no one correct way to design a portfolio. The design should be driven by a clear understanding of the desired outcome from using portfolios and the knowledge and skills to be assessed. How the portfolio will be used will determine the design and focus of the portfolio development. Portfolios are not an end in themselves and must be developed with a clear vision of the desired outcome.ⁱⁱ

Over the past few years there has been an increase in the number of institutions using portfolios as a means to document and assess student work.ⁱⁱⁱ Many institutions have capitalized on the use of technology to create a more efficient portfolio process. Based on four years of experience developing and using portfolios at Rose-Hulman Institute of Technology, the decision to use portfolios in an electronic format is described. Based on the experience of implementation, both the promise and pitfalls of electronic portfolio use is discussed.

Rose-Hulman assessment plan

The Commission on the Assessment of Student Outcomes (CASO) was charged with developing an institutional assessment plan to provide information for quality improvement and satisfy the needs of external accrediting agencies. Student learning outcomes represents a significant portion of the assessment plan, and much of its development occurred in the summer of 1997. At that time, a sub-team of CASO devoted particular attention to student outcomes assessment for the plan. The goal for student outcomes is: **Instill in our graduates the skills appropriate to their professions and lifelong learning.** There are nine objectives that further specify these skills: ethics, teams, communication, global awareness, experiments, design, engineering practice, interpreting data, and contemporary issues. Each of these skills has multiple, measurable, specific performance criteria that define the skill.

Faculty researched various data collection methods that could be implemented. These methods included course grades, questionnaires and surveys, standardized tests, qualitative methods, and portfolios. Four main criteria developed for selecting the primary data collection method. The method should:

1. Be rich, offering quality information about students in a breadth of outcome areas.
2. Produce valid results and reflect the uniqueness of the institution.
3. Be minimally intrusive on the time of students and faculty.
4. Serve students by engaging them in reflection on their own education and help them as they prepared for their careers or further education.

Based on these criteria, the portfolio method was chosen. Because of Rose-Hulman's computer intensive environment, it was determined that the portfolio system should be electronically based.^{iv}

Promise

The electronic portfolio (RosE-Portfolio) was designed and developed by Rose-Hulman faculty, staff, and students.^v The design was driven by how portfolios were to be used by both faculty and students. Having portfolios in an electronic format has four distinct advantages over paper portfolios:

1. Efficiency
2. Asynchronous access
3. Validation of process
4. Adaptability

Efficiency: Portfolio systems can be very cumbersome to manage for both students and faculty. By developing an electronic system to access, store, view, and rate student material the amount of effort to manage the system is minimized. We were also able to design a system that integrates the student submission process, the rating process, the reporting process, and the curriculum mapping process into one module. When students enter the system they can easily access the list of student outcome objectives, see the rating rubrics, view on-line helps, or submit questions and comments.^{vi}

Asynchronous access: The RosE-Portfolio system is web-based and access is made through the local area network using the user's network username and password. This allows both student and raters to access the system from anywhere at anytime they have access to the web. Students can make submissions to their portfolio from their home, their residence hall room, or anywhere it is convenient for them at any time. This means that students can work on their portfolio at times when they are not so busy with their coursework. The system also allows for raters to rate at their convenience against pre-established rubrics. Because teams of raters are involved, the system also provides for inter-rater reliability testing. This "calibration" of the rating process promotes the validity of the rating results. This aspect of the rating system will become increasingly important as we begin to involve alumni and business partners in the rating of portfolios.

Validation of process: In designing the system requirements for the development of the software, it was found that the process of determining design requirements forced the Commission to think through the purpose and scope of the system in ways that actually promoted the efficiency and validity of the process. That is, by having to clearly articulate what the features of the portfolio would be, it was necessary to think through what we wanted students to do, why we wanted them to do it, and what we were going to do with the information. This was particularly true for the design of the rating module. The rating system was driven by the purpose of the ratings and how the results would be used. By integrating all these decisions into the design of the portfolio itself it was possible to continuously check our decisions against good assessment practices.

Adaptability: One of the design constraints was that the system be developed to be adaptable to other forms of documentation and assessment. As the Institute-wide electronic portfolio system was developed, implemented, and improved it was adapted for use in individual classes. Building on the existing system, some faculty modified the portfolio structure for both student teams and individual student submissions for learning outcomes that were specific to the course, in some cases, moving to a paperless environment. Plans are also being made to prototype a system to be used for the faculty promotion, tenure and retention process. The power of the electronic format and ease of adaptability serve to promote multiple uses of the system.

Pitfalls

In spite of the advantages of the electronic portfolio, there are also some pitfalls that need to be avoided.

1. Too complex
2. Inadequate design expertise/technology resources
3. Technology overshadows assessment
4. Short-term commitment

Too complex: It is important to minimize the number of steps and the complexity of instructions in the use of an electronic portfolio. For the users of the system both the design and the materials developed to support the implementation of the system must be kept simple. The term “user-friendly” has to be a key aspect of developing materials to walk people through the process of submitting, reviewing, and rating portfolios. If the system is too complex for it to be easily understood, or if the materials developed are too difficult to understand it will be difficult to get participation from both faculty and students. This is not to say that the electronic portfolio can’t be designed for multiple purposes and users. However, for the individual user, the complexity must be invisible.

Lack of design expertise: Many campuses do not have expertise available to assist with the design of an efficient and effective electronic portfolio system. The responsibility for developing the system may be left with those who do not have the appropriate programming/technical expertise, or do not understand the importance of involving the multiple constituents in the design process before developing the system. Without the appropriate expertise, it is unlikely that an electronic portfolio system can be designed to meet the needs of assessment.

Technology overshadows assessment: For those who have both the resources and the desire to develop an electronic portfolio system it is possible that the enthusiasm for the electronic side confuse the means and the ends. It is important to remember that the electronic nature of the portfolio is to enhance the portfolio process by making it more efficient and user-friendly. However, efficiency should not be at the expense of good practices in assessing student learning. Portfolios of any kind are not for novices. Whether the portfolio is electronic or paper-based it is important to understand the purpose of the portfolio, what data are going to be collected, who is going to be responsible for submitting material to the portfolio, what rating criteria are going to be used, who is going to rate the material in the portfolio, how the rating process is going to be organized and managed, the use of the data collected, and how the students are going to get feedback. The answers to these questions help to drive the design of the system and not the other way around. In any case, best practices for student assessment should be followed.^{vii}

Short-term commitment: When viewed as a short-term commitment, the development of an electronic portfolio system (as well as paper-based) is sure to fail. Because the commitment required to support and sustain a portfolio system is substantial, it is not an approach that should be entered into for the short-term. Resources need to be allocated for the design of the system. Faculty and students need to be educated about the use of the system. The system needs to be managed and nurtured. All of these processes take time to develop, implement, and improved to meet the needs of the institution.

Lessons learned

The following lessons learned in the past four years can be applied to the task of developing an institution-wide plan for assessing student learning.

Develop a common language. The importance of language as a means of conveying meaning cannot be overstated. This is especially true in the language of assessment in the current environment where there are many debates about the role of assessment as it relates to accreditation requirements. Confusion over the meaning and use of the language of assessment often alienates the very people who need to be engaged in the development and use of assessment processes – the faculty. Because there is no commonly accepted standards of assessment terminology, it is important to develop a common vocabulary of assessment terms at the beginning of the process and agree to use them consistently.

Involve the key stakeholders. At the beginning of the process, identify who YOUR key stakeholders are. This will vary from institution to institutions. Everyone is important, but not everyone is equally important to determining what outcomes are appropriate for your institution. Don’t forget to involve students!

Ask them, ask them, and ask them again. Faculty have a very long list of “important things” they have to do. Not all of them make it to the top of the list. It would be erroneous to assume that just because you don’t get feedback from faculty that they are not interested or do not want to have input. It is important to keep them informed of the progress that is being made and solicit their input.

Decouple institutional assessment from faculty evaluation. Institutions have processes in place to evaluate faculty performance. The assessment of student outcomes for institutional effectiveness purposes should not be one of them. Faculty cooperation is critical to assessment and if they feel that the process can be used against them, the likelihood of their participation is decreased.

All assessment questions are not equal. Use a common sense approach to planning. As the assessment plan begins to be developed it is important to realize that you cannot do everything. There will be a lot of interesting questions that you would like to have answered, but it is important to prioritize and begin with the most important questions first.

One size does not fit all: The pressure to develop assessment plans and the lack of expertise in institutional or program assessment can lead to the temptation to adopt another institution's assessment methodology without seriously considering whether or not it is appropriate to the local environment. Much can be learned by looking at what others are doing to assess student learning outcomes but it is rare that the plans and methodology from one institution can be adopted in total at another.

Summary

Deciding what methodology to use to assess student learning outcomes is an important aspect of assessment planning. The criteria for choosing an appropriate methodology should be carefully developed, and tailored to the needs of the institution. Electronic portfolios can be both efficient and effective to assess student learning outcomes at a program or institutional level. When principles of best practice for assessing student learning are applied, the benefits for promoting institutional effectiveness is greatly enhanced. Institutions developing assessment plans and choosing assessment methodologies can strengthen their processes by reviewing the lessons learned from others.

ⁱ Paulson, L.F., Paulson P.R., & Meyer C. "What makes a portfolio a portfolio?" Educational Leadership, 1991, 48(5), 60-63.

ⁱⁱ Arter, Judith A., *et al.* "Portfolios for Assessment and Instruction," ERIC Digest, 1995. No. ED388890.

ⁱⁱⁱ A national database of electronic portfolios can be found at:
http://www.aahe.org/teaching/portfolio_db.htm

^{iv} Rose-Hulman has had a student-owned laptop program since 1995.

^v For a complete discussion of the design of the Rose-Hulman electronic portfolio, see: Rogers, Gloria Martin and Julia Williams, "Building a Better Portfolio." *ASEE PRISM*, 30-32, January 1999.

Rogers, Gloria Martin and Timothy Chow, "Electronic Portfolios and the Assessment of Student Learning." *Assessment Update*, Josey Bass Publication,

^{vi} On-line demo of the RosE-Portfolio can be seen at: <http://www.rose-hulman.edu/ira/reps>

^{vii} American Association of Higher Education, *9 Principles of Best Practice for Assessing Student Learning*. <http://www.aahe.org/assessment/principi.htm>.