The Relationship Between Electronic Portfolio Participation and Student Success: Results of a Pilot Study

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Abstract

Electronic portfolios represent an assessment measure with strong potential for providing feedback about student performance to improve curricula and pedagogy, determining individual students' mastery of learning and providing feedback for improvement, and actively involving students in the assessment process. Electronic (web-based) portfolios offer particular advantages. This study examined the relationship between e-portfolio participation and student success. Despite a small population size, the finding revealed significant relationships between e-portfolio participation and cumulative grade point averages and credit hours earned, but not retention, even when background factors were controlled. Number of e-portfolio artifacts, number of years of students' work represented in the portfolios, number of reflections, and number of media types included were not found to be significant predictors of student success. Future phases of this ongoing study will include much greater numbers of participants and assessments of the quality of student artifacts and reflections.

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Many criticisms exist of contemporary American higher education. Some fear that students are not developing competencies such as communication, critical thinking, and a developed sense of social responsibility. There has been increasing skepticism concerning the quality and utility of a liberal arts education. Members of the public, employers, and legislators are concerned with the perceived lack of attention that faculty give to undergraduate learning. Colleges and universities must respond to these criticisms at the same time that students come to campus with an increasingly diverse array of experiences, preparation, and expectations.

Several longitudinal studies carried out in recent years and across a wide variety of institutions have highlighted problems affecting the state of undergraduate learning in the United States. Such problems include a discontinuity between K-12 schools and colleges, institutional confusion over purposes and goals, the tension between the liberal arts and professional curricula, faculty feeling split between their loyalty to their institutions vs. their disciplines and between their interests in teaching and research, and the divisions between academic and student affairs on campuses. These studies highlight the need to draw more explicit connections between the classes students take as well as between their in- and out-of-class experiences, the need to become more student-centered, the need to promote student-faculty and student-student interaction and collaborative and active learning activities, the need to improve and make explicit student engagement, high expectations, and assessment, and the need to emphasize competency over content and collaboration over competition (Astin, 1993; Boyer, 1987; Gamson & Chickering, 1987; Joint Task Force, 1998; Kellogg Commission, 1997; Kuh, Schuh, & Whitt, 1991; National Institute of Education, 1984; Pascarella & Terenzini, 1991; Schneider & Schoenberg, 1998).

Assessment has been suggested by many as a means of addressing these problems. The "assessment movement" that began in the mid-1980s has been traced to both an extant scholarship of student learning and success (e.g., Astin, 1977; Bowen, 1977; Feldman and Newcomb, 1969; Learned and Wood, 1938; Pace, 1977; Tinto, 1975) and especially to a series of calls from outside of the academy to improve accountability (e.g., National Governors' Association, 1986; U.S. Department of Education, 1983). While 98% of institutions reported having an assessment program by 1993 (American Council on Education, 1993), many scholars and practitioners have noted that assessment has not substantially improved student learning at most institutions. Ewell (2002) notes that this lack of success mat be a result of disagreement about the underlying purposes of assessment; is it for benchmarking institutional performance in the name of accountability as in K-12 education, is it intended to provide feedback about student performance to improve curricula and pedagogy, or is its goal to determine an individual student's mastery of learning and to provide feedback for improvement? Ewell (2002) suggests that for assessment to move from its current state of "broad but not deep," fundamental changes must occur. The assessment paradigm must shift from "a largely top-down, management-oriented" evaluation and passive checking of results to one of "active and collective responsibility for fostering student attainment" that resides at the level of the individual faculty member and academic program (p. 24).

Student portfolios have become an increasingly popular assessment method throughout the 1990s (Ewell, 2002). Banta (1999) has termed them "the instrument of choice for assessment on a growing number of campuses" (p. 3). Portfolios hold a high degree of promise for accomplishing the last two purposes of assessment noted by Ewell (2002): providing feedback about student performance to improve curricula and pedagogy as well as determining individual students' mastery of learning and providing feedback for improvement. Also, portfolios achieve a goal that many other assessment methods can not; they change the student role in assessment from passive research subject to active participant as students are called upon to select samples of their classroom and co-curricular work products for the portfolio and (perhaps most importantly) to reflect upon why these artifacts were selected and how they demonstrate learning (Palomba, (2002). Portfolios are not without their challenges as an assessment method; they require a great deal of faculty and student time to be used successfully and require clear guidelines about their purposes and the way in which their contents are to be evaluated and feedback is to be provided.

In addition to the features associated with paper and pencil portfolios, electronic (web-based) portfolios offer the advantages of accessibility and portability of artifacts, faculty/advisor assessments, and student

reflections. Also, artifact formats such as video and sound recordings that are difficult to include in traditional portfolios are easily included in e-portfolios. Finally, many e-portfolio software packages allow students to control who is able to view each artifact; they allow reflection and assessment; and they permit both developmental/assessment and showcase (for prospective employers, graduate/professional schools, etc.) formats to be presented. (Cambridge, 2001; Yancey, 2001).

Bowling Green State University (BGSU), a state-assisted, residential, doctoral-research intensive university in northwest Ohio, has grappled with many of the assessment challenges noted above. While most academic programs have developed learning outcomes, created or acquired associated measures, and collected data, and some examples of improvements to curricula and pedagogy are evident, assessment has not led to profound changes in student learning or to a widespread "culture of evidence." Many faculty and nearly all students are not aware of assessment efforts and a bureaucratic compliance mentality still permeates many annual assessment reports. At the same time, the University has articulated as its vision a desire to be "the premier learning community in Ohio and one of the best in the Nation," developed a wide slate of learning communities and other student academic enrichment programs, identified a set of University learning outcomes, redesigned its general education program from one that emphasizes fulfilling curricular breadth requirements to one that emphasizes master of learning competence, substantially upgraded its technology infrastructure, and improved its institutional research capacity.

BGSU joined the ePortConsortium in 2002 and acquired the Epsilen electronic portfolio software in 2003. As noted above, students can place a variety of artifacts (e.g., papers, spreadsheets, presentations, video and audio recordings) and accompanying reflections into both a year-by-year matrix for assessment purposes and also into a "showcase" version of the portfolio that might be viewed, for example, by potential employers or graduate/professional schools. Additional information about the BGSU electronic portfolios can be found at http://epsilen.with.bgsu.edu. The first widespread use of e-portfolios by students occurred in the 2003-2004 academic year, as they were adopted on a voluntary basis by many of the first year student programs on campus and also by the College Student Personnel master's degree program. The University joined the National Coalition for Electronic Portfolio Research, sponsored by the American Association for Higher Education, in 2004 in order to facilitate research on the effects of e-portfolio participation on student learning and success. This paper describes the first such research study, which was designed to investigate the following research questions:

1. What are the characteristics of students who have electronic portfolio artifacts and how are such students different than others at BGSU?

2. What significant differences exist in retention rates, grade point averages, and credit hours earned for BGSU students who do and do not have electronic portfolio artifacts?

3. What significant differences exist in students' self-reported academic engagement for BGSU students who do and do not have electronic portfolio artifacts?

4. Are there significant relationships between various artifact measures (number of showcase artifacts, number of matrix artifacts, number of years represented in the matrix, number of reflections, and number of media types included), retention rates, grade point averages, and credit hours earned for students who have electronic portfolio artifacts?

5. Does having electronic portfolio artifacts significantly predict retention, grade point average, and credit hours earned after student background factors (gender, race, age, high school grade point average, living arrangements, and college for undergraduate students and gender, race, age, and GRE scores for graduate students) are controlled for?

Method

A listing of all 2003-2004 e-portfolio accounts was extracted from the portfolio database in the summer of 2004. While 436 accounts existed, an inspection of the contents of each revealed that only 75 actually contained one or more artifacts (this is why the research questions listed above are phrased to indicate

"students with e-portfolio artifacts" rather than simply "students with e-portfolios"). The number of showcase artifacts, number of matrix artifacts, number of years represented in the matrix, number of reflections, and number of media types included were recorded for each portfolio. Demographic (sex, race, age, college, class rank, academic status, living arrangements [on- or off-campus], high school grade point average, ACT composite score, and GRE verbal, math, and analytical scores) and educational outcome (retention from Spring to Fall 2004, cumulative grade point average and student credit hours earned as of the conclusion of the Spring 2004 semester) data were collected for both the 75 students with e-portfolios and a matching comparison group. The comparison group for graduate students was matched by major and gender. The comparison group for undergraduates was matched by college, class rank, gender, and ACT score. Unfortunately, due to the small population size, data from the two surveys used to measure student academic engagement (the National Survey of Student Engagement and the locally-developed New Student Transition Questionnaire) were not available for any members of the e-portfolio population; thus Research Question Three could not be addressed in the current study. Descriptive, univariate, and multivariate statistical analyses were used to address the remaining research questions.

Results

Table 1 describes the population of BGSU students with e-portfolio artifacts. Among graduate students, those with portfolio artifacts were significantly more likely to be masters rather than doctoral students (94% of the students with artifacts were at the masters level compared with 55% of other graduate students, $\chi^2 = 21.6$, $df = 3$, $p < .001$) and to be concentrated in the College Student Personnel major (88% of the students with artifacts were CSP students as compared with 15 of other graduate students, $\chi^2 = 1202.7$, $df = 137$, $p < .001$) than were all BGSU graduate students. GRE scores were not significantly different between the two groups: the GRE verbal mean was 476 for those with artifacts and 461 for other graduate students ($t = 0.8$, $df = 2224$, $p > .05$), the GRE math mean was 510 for those with artifacts and 533 for other graduate students ($t = 1.0$, $df = 2224$, $p > .05$), and the GRE analytic mean was 576 for those with artifacts and 554 for other graduate students ($t = -0.9$, $df = 1450$, $p > .05$). Graduate students with portfolio artifacts were significantly younger (mean 27.5) than other graduate students (mean 33.1) ($t = -3.3$, $df = 3334$, $p < .01$). Among undergraduate students, those with portfolio artifacts were significantly more likely to be female (73% of those with artifacts were female as compared with 56% of other undergraduate students, $\chi^2 = 5.1$, $df = 1$, $p < .05$), to be juniors and seniors (93% of those with artifacts were juniors or seniors compared with 63% of other undergraduate students, $\chi^2 = 16.6$, $df = 4$, $p < .01$), and to be in the Colleges of Education and Human development and Musical Arts (81% of those with artifacts were in those two colleges as compared with 32% for other undergraduates, $\chi^2 = 145.9$, $df = 8$, $p < .001$).

As noted in Table 2, graduate students with portfolio artifacts had significantly greater credit hours earned than graduate students without e-portfolio artifacts, while undergraduate students with e-portfolio artifacts had both significantly greater cumulative grade point averages and credit hours earned than undergraduates without e-portfolio artifacts. There was no significant difference in retention rates between undergraduate students with and without e-portfolio artifacts, as shown in Table 3. Please note that students who graduated in May or August 2004 were not included in the retention analysis and also that all graduate students were retained in both groups, so the analysis was carried out for undergraduates only.

Tables 4 and 5 highlight the fact that none of the artifact measures (number of showcase artifacts, number of matrix artifacts, number of years represented in the matrix, number of reflections, and number of media types included) were significantly related to retention, grade point average, or credit hours earned. Again, the retention analysis was not carried out for graduate students since all of them were retained. Also, no graduate students included reflections in their portfolios.

Tables 6 through 10 array the results of a series of regression analyses that investigated differences in retention rates, grade point averages, and credit hours earned between students who did and did not have e-portfolio artifacts, after demographic and educational background factors were controlled. No significant differences were found concerning retention (Table 6) or grade point average (Tables 7 and 8). For both graduate and undergraduate students (see tables 9 and 10, respectively) those with e-portfolio artifacts had significantly greater credit hours earned after background factors were controlled.

Discussion

The current research represents only a pilot study given that the small number of students with electronic portfolio artifacts severely limits its usefulness. Other limitations should also be considered; for example, the relationship with credit hours earned for graduate students might disappear if date of entry to the graduate program was controlled (it was not a matching factor in drawing the comparison group).

The next phase of the research, to be completed during 2005, will capitalize on the much more widespread use of e-portfolios at BGSU during 2004-2005. The number of students with electronic portfolio artifacts is expected to increase to several hundred . A special administration of the National Survey of Student Engagement is also planned during Spring 2005 for 1,000 e-portfolio participants.

Another major limitation of the study will be addressed in the next two years as BGSU completes development and implementation of rubrics for the University Learning Outcomes and student reflections. This will allow the research to move from simply examining differences in retention, grade point averages, and credit hours earned based upon whether students have-portfolios artifacts to collecting and using data on scores associated with e-portfolio artifacts and reflections.

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