MOTIVATING STUDENTS BY LEVERAGING THE EMOTIONAL DYNAMICS OF ASSESSMENT

Richard Pierce
Fairmont State University

INTRODUCTION

Enterprises that depend on the development of human capital are challenged by the need to adopt best practices that entice adaptive academic behaviors, increase self-efficacy, and encourage intrinsic motivation. Optimizing learning to a diverse student population with a wide variety of skill levels requires differentiation of instruction and assessment techniques for student learning. Stiggins (2006) holds that assessment techniques do more than provide feedback of student performance. Assessment can be a leveraging tool to enhance learning by motivating the student. Decades of technical advances in assessment have resulted in a deep understanding of how to produce, scale, and interpret norm referenced test scores (Stiggins, Chappuis, & Chappuis, 2006). These advances provide little insight for practitioners to develop and employ assessments that positively impact the self-regulating mechanisms that influence student behavior. The trend towards criterion-referenced mastery in a standards-based environment portends an expanded role of assessment techniques which support student learning and increase motivation by addressing the affective dynamics of assessment. This study examines the relationship between authentic assessment practices and pre-service teacher ICT self-efficacy.

Instructors who wish to facilitate personal development must create an environment that encourages and rewards intellectual openness (Taylor, 1998).Within this conception of transformative teaching and learning, presenting new information is not enough. Schools of education must model best practices which demonstrate a new paradigm born of imagination and creativity.

The verdict is still out on weather or not teacher educator preparation programs have the ability to prepare pre-service teachers to use technology as instructional tool, let alone use technology to motivate learners. In 1999, the United States Department of Education calculated that only 20% of teachers felt comfortable using technologies in the classroom and the majority of those were teachers with more than five years of experience (Dorman, 2001). While the availability of computers increased in PK-12 classrooms the 1990s, there was only a slight increase in the use of them by students (Hofer, Chamberlain, & Scott, 2004). Teacher preparation programs are directly impacted by a growing body of research that suggests the role of the instructional facilitator is critical to the development of student competencies and attitudes (Garet, Porter, Desimone, Birman, & Yoon, 2001; LaFrenz & Friedman 1989; Mitchell, Wells, & Wells, 2003; Wang, Ertmer, & Newby (2004). The predictive utility of self-efficacy beliefs by many previous findings suggests teachers, trainers, and instructional designers may benefit by being more attentive to students' precepts of self-efficacy (Young, J., Bong, M., Choi, H., 2003). Assessments that evaluate students' ability to reason, solve complex problems, and apply their

understanding in "real world" contexts are being widely used across the country by teacher preparation programs (Sheppard, 2000). These implementations are used to promote student learning, professional development, reflection, and to provide evidence for evaluation (Stone, 1998).

Increasing ICT self-efficacy regarding through authentic assessment may impact pre-service teachers' willingness and ability to address a constantly evolving knowledge base and skill set. Bandura's (1977) social cognitive theory of self-efficacy encompasses many constructs and dimensions and is defined as people's judgments of their capability to organize and execute courses of action required to attain designated types of performances. It is concerned not with the skills one has but with judgments of what one can do with whatever skills one possesses (Bandura, 1986). Self-efficacy is a fluid construct that changes with experiences (Bandura, 1977). Self-efficacy has been shown to be a valid predictor of behavior and central levels of motivation (Bandura, 1986; Schunk, 1984; Zimmerman & Ringle, 1981). Performance outcomes, including academic achievement and behavior (Oliver & Shapirio, 1993; Schunk, 1991), and student performance in academic settings (Holcomb, Brown, Kulikowich, Zheng, 2003) are also closely associated with self-efficacy. The continued integration of technology in educational practice has enabled researchers to analyze the impact of ICT self-efficacy on teachers' adoption and implementation of new technologies. Information, communication, and technology self-efficacy is positively correlated with willingness to choose and to participate in computer activities, expectations of success, persistence when faced with computer-related difficulties, and computer-related performance (Karsten & Roth, 1998). Understanding the relationship between ICT self-efficacy and pre-service teacher dispositions informs instructional and assessment strategies that assist in the development of fuller computer competencies. New curricular innovations and assessment strategies can be implemented to increase ICT self-efficacy and enhance student learning.

DESCRIPTION OF THE STUDY

The purpose of this study was to identify the impact of authentic assessment, including: self assessment, peer evaluations, and instructor review of web-based portfolios, on teacher education students' ICT self-efficacy. Student work and progress in instructional technology courses were evaluated longitudinally by a variety of assessment strategies including: self assessment, peer review, and instructor's examination of the students' electronic portfolios. The portfolios contained a combination of teacher required work samples, student selected work samples, and student reflections. The guiding questions in addressing the relationship between ICT self-efficacy and authentic assessments were as follows:

Research Question 1: Are there differences between pre and post survey scores of the self-reported levels of ICT composite self-efficacy after exposure to authentic assessments?

Research Question 2: Are there differences between the pre and post survey sub-scores including: operating systems, word processing, database/spreadsheets, presentations, and internet and educational technology for ICT self-efficacy after exposure to authentic assessments elements?

Data was drawn over a three year period from EDUC 2201 Instructional Technology, a required undergraduate course and EDUC 6305, Advanced Instructional Technology, a required graduate course in the school of education at Fairmont State University between 2005 and the spring of 2008. The student population is characteristic of the Appalachian region in that its constituents are primarily Caucasian, rural, and first generation college students. A 40- item survey instrument was administered to determine the student's ICT self-efficacy within five broad categories 1) Operating Systems; 2) Word Processing; 2) Spreadsheets; 4) Multimedia; and 5) Internet / Educational Technology practices. Students completed an electronic administration of a pre-efficacy survey on the first scheduled class and an identical post-efficacy survey at the conclusion of the course. The survey instrument was developed to evaluate in-service teacher ICT self-efficacy after an on-line assessment (Holcomb, 2003). The pre-test Cronbach reliability estimate for the total instrument was .97 and the post-test estimate was .96, indicating that the instrument was very stable. The 202 participants included undergraduate 164 (81.1%), graduate 38 (18.2), female 160 (79.2%), male 42 (20.8%) and non-traditional undergraduate 31 (15.3%) students. Students may take the courses examined at any stage in the program and there was a wide degree of variability in the computer skill sets of the incoming students. The same assessment techniques were used in all courses. Pre and post data was provided for 145 of the respondents. Descriptive statistics for the pre-test and post-test composite scores are detailed in [Table 1]. The sub-score pre-test and post-test descriptive appear in [Table 2]

Table 1

Composite Mean and Standard Errors

Composite Score	
Pre Mean	132.88
Pre Standard Error	2.441
Post Mean	180.08
Post Standard Error	1.364

Table 2

Sub-Score Means and Standard

Composite Scores	Mean Difference	Standard Error mean	t	P-Value
Total Pre-Post	-47.20	1.979	-23.851	< .001*

n=145 Level of significance .001

FINDINGS

Research question 1 examined if there were significant differences between the self-reported pre and post-test ICT self-efficacy composite scores. The post-test composite means (n=145, N=132.88) were notably higher than the pre-test group (n=145, M=180.08). Significance was tested using paired-samples t-tests. See [Table 3] for the results, which indicated the gains in ICT self-efficacy scores were significant at ($p < 0.001$).

Table 3

Composite Pre-Post independent t-test results

	Operating systems	Word Processing	Database/ Spreadsheets	Multi-media	Internet Educational Technology
Pre Mean	21.39	20.98	19.01	26.41	45.23
Pre Standard Error	456	.315	.594	.743	.864
Post Mean	25.92	24.12	30.55	36.79	62.72
Post Standard Error	.346	.120	.356	.312	.526

n=145 Level of significance .001

Research question 2 examined if there were significant differences between the self-reported pre and post-test sub-score dimensions of ICT self-efficacy including: Operating Systems, Word Processing, Spreadsheets, Multimedia, and Internet/ Educational Technology. To examine these findings, a series of paired-samples t-test were computed for each dimension's score pairs. The differences between the self-reported pre and post-test ICT self-efficacy for each sub-score were significant at ($p < 0.001$). See [Table 4] for the results of the significance testing for each sub-score.

Table 4

Sub scores independent t-tests

	Mean Difference	Standard Error Mean	t	P-Value
Operating Systems Pre / Post	-4.53	.356	-12.728	< .001*
Word Processing Pre / Post	-3.14	.274	-11.471	< .001*
Database Spreadsheets Pre / Post	-11.54	.556	-20.743	< .001*
Multimedia Pre / Post	-10.38	.630	-16.466	< .001*
Internet Educational Technology Pre / Post	-17.48	.757	-23.088	< .001*

n=145 Level of significance .001

Analysis of the changes from pre-efficacy to post-efficacy indicated significant gains on the total score and on each of the five sub-scores. This study indicates that authentic assessment strategies including: self assessment, peer evaluations, and instructor review of web-based portfolios contributes to significant gains on participant's composite and sub-score self-efficacy. These findings comport with the findings of earlier studies that suggest that authentic tasks and authentic assessment practices positively impact participant self-efficacy, and redefine the arbitrary boundaries between assessment, professional development, and practice (Holcomb, 2003; Pierce, 2008). The intent of the application of the self-efficacy instrument was originally to

provide evidence of student's perceived progress towards mastery of technology standards and the findings from this study are not intended to be generalizable.

CONCLUSIONS AND RECOMMENDATIONS

If students' cognitive and emotional processes can impact motivation, resilience, and learning outcomes, how can these findings be used by professional development schools and educators in academic settings? Teachers and researchers are beginning to recognize how pedagogy and assessment strategies may contribute, positively or negatively to student attitudes and behaviors. This study suggests the use of authentic assessment promotes domain specific ICT self efficacy. The findings suggest educators may entice adaptive dispositions and academic behaviors, especially in first generation college students by their choice and implementation of curricular activities and their related classroom assessment strategies. Authentic assessments promote student learning and enhance the teaching and learning process by not focusing exclusively on traditional measures of academic prowess.

Questions remain about the impact of authentic assessment on ICT self-efficacy. Further study is needed to delineate the impact of the pedagogical activities themselves from the assessment techniques. Longitudinal analysis may assist in determining the relation between ICT self-efficacy and the adoption of technology into other settings including: other courses, student teaching, or in-service teaching? Further studies are needed to evaluate the impact of ICT self-efficacy on practice.

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