The Impact of Assessing Technology Competencies of Incoming Teacher Education Students

Abstract: In an effort to establish a baseline of technology competency among our entering education students, our College of Education began implementing an Assessment of Technology Competencies (ATC) in Fall 2003. This performance-based assessment that evaluates word processing, presentation, spreadsheet, graphic/drawing, and Internet skills. Although students are not required to pass the ATC, failure impacts their final grade in an Introduction to Education course. This paper explores the impact this assessment has had on the students’ use and development of technology in subsequent courses for those who completed the ATC in Fall ’03 or Spring ’04. Student perceptions of the ATC and its impact were elicited through a self-reported survey administered in a junior level education course. Results indicate that the ATC has facilitated technology use and development among the participants. Respondents also revealed that their high school experiences with technology adequately prepare them for passing the ATC, despite the fact the most students are unable to pass the ATC in the first attempt.

Introduction

In Fall 2003, our College of Education began implementing the Assessment of Technology Competencies (ATC) with all incoming education majors. This assessment was developed to insure that students possess a baseline of technology skills that would be advanced throughout their teacher education course work—a foundation of skills that has been cited by numerous studies as advantageous in developing a technology-using educator (Deal, 2002; Gomm, 2003; Liu, Johnson, & Maddux, 2001a, 2001b; Strickland, Salzman, & Harris, 2000). With this type of foundation, our teacher preparation programs would then be able to provide students with experiences that nurture powerful technology integration in P-12 settings. More specifically, teacher preparation can then focus on the pedagogy of technology integration in the classroom and not necessarily on the acquisition of technology skills (Banister & Vannatta, 2006).
The ATC is a five-page document that details the construction of four digital products to be completed by the student in a proctored, two-hour session in the college’s computer lab. (A sample of the ATC is available online at http://xxxx.xxxx.edu/atc/info.) The products use word-processing, spreadsheet, presentation, and graphics software applications, and integrate Internet and file management expertise. After reviewing computer skills in the National Education Technology Standards for Teachers (NETS-T), BGSU faculty identified the assessed skills as essential for first-year education students (ISTE, 2002). The technology competency assessment is tied to the student’s enrollment in EDHD 201, an introduction to education course that all entering education students at BGSU are required to take. Instructors for this course are not expected to teach any technology skills, nor oversee the testing periods. Students are given copies of the assessment upon their university enrollment, and encouraged to practice the targeted skills before they begin their coursework. Online written and video tutorials are provided through the university’s website (http://xxxx.xxxx.edu/atc/tutorials/), and incoming students are given information on how to access these resources with specific citations corresponding to the skills included in the assessment.

Basically, our teacher education programs expect incoming students to enter with a foundation of skills that can be used in general education and applied in the context of PK-12 education within one’s professional preparation (Frieden & Scott, 2003). During the first month of the semester, students are asked to sign-up for an assessment time in the college computer lab. The four products created in this two-hour, proctored exam are transferred to space on the college’s dedicated server to be evaluated. Evaluation of these products was conducted by a faculty member and graduate assistants using detailed rubrics. Although students were not required to pass the ATC, failing the exam would impact their course grade by one letter grade. As such, students were provided an opportunity to retake failed portions of the ATC.

The Follow-Up
To examine the impact that the establishment of a baseline of technology competencies had on students’ technology use and skills in later course work, a follow-up survey was administered to all students enrolled in a junior-level education course. The survey evaluated student perceptions regarding their subsequent application of technology skills assessed in the ATC, the value of the ATC in furthering their technology skills, the technology resources utilized since the ATC, the subsequent courses that have advanced their technology skills the most, and overall response to the ATC. The survey was administered during Fall 2005 to 148 students enrolled in a junior level education course that focuses on issues of diversity. The researchers administered the survey in the final ten minutes of class. Among these participants, approximately 70% passed all four sections of the ATC, after two attempts, in 2003-2004.

**Results and Conclusions**

Results indicate that the majority of respondents have continued to use Word Processing (95%), PowerPoint (91.8%), and Spreadsheet (56.7%) in their course work since taking ATC. Surprisingly, only 41.7% of participants have continued to use graphic/drawing tools. When respondents were asked to identify the top three courses that have enhanced their technology skills, participants identified 70 specific courses that included the introductory course that implements the ATC, the “technology course” and many other program specific courses. Out of all the courses cited as encouraging/requiring advanced uses of technology, 79.8% of these courses were from college of education offerings. Specifically, 10.5% cited their junior-level technology course\(^1\), and 31.7% cited their “Education in a Pluralistic Society” course. The remaining

\(^1\) Since more than half of these teacher candidates take their technology course as a part of their senior methods block (only early and middle childhood majors take the tech
half of courses cited were distributed over a range of 68 different courses, most being from the college of education, but 21.2% being courses from the college of arts and sciences. These indicators suggest that technology is being integrated across the teacher education coursework—an ultimate goal of our teacher education faculty (Vannatta, et al., 2005).

Students also indicated that completing the ATC was effective way of encouraging the development of technology skills (63.5%). Interestingly, the majority of students (69.6%) felt that their high school experience adequately prepared them for passing the ATC, despite the fact that only 25% typically pass the ATC in the first attempt. When participants were asked if the ATC is a necessary component in our teacher education programs, 133 responded. The majority (n=85) positively viewed the ATC and saw the necessity of basic technology skills in education coursework and the teaching profession; e.g., “I think it is necessary to know those skills for the future.” Negative comments (n=37) reflected two extreme perspectives of technology competency and where that competency should be achieved. One perspective indicated that skills were very basic and taught in high school, therefore the ATC was redundant and not necessary; e.g., “It’s [the ATC] a waste of time. Most freshmen have the basic skills to pass the test, and it did little to increase my skills.” In contrast, the other extreme expressed frustration in being “expected” to know these skills without being provided the necessary instruction; e.g., “No, I feel we should have a class first before testing. It [the ATC] did not teach me anything.” We also analyzed the extent to which ATC scores differed by having a positive or negative perception of the ATC. T test of independent
samples revealed that students with positive perceptions had higher ATC scores than those with negative perceptions; \( t(89) = -2.6, p = .013 \), two-tailed.

In conclusion, implementing the ATC has created a baseline of technology skills among our entering education students—skills that have been continued and advanced throughout their teacher education program. Students feel positively about the ATC since it forced them to gain the skills necessary for later coursework. Added benefits of assessing teacher candidates technology competencies as freshmen include increasing the students' awareness of the importance of technologies in teacher education and assisting students in recognizing and using the multiple technology resources available to them on campus. In the process of preparing for and taking the ATC, students were taking advantage of these resources (online tutorials, various computer labs, etc.) and becoming comfortable with using these.

Other teacher education programs should consider the implementation of an assessment of technology competencies for entering students so that a foundation of technology skills is established and then enhanced throughout teacher preparation. The assessment is especially important since entering college students perceive their technology skills as adequate, yet most students are unable to pass the ATC in the first attempt (Banister & Ross, 2006). Although technology standards have been established for K-12 students, most high schools do not require a level of technology competency among their graduates. Until technology assessment procedures are implemented at the high school level, high school graduates will continue to enter higher education with varying levels of technology skills (Achieve, 2004). As such, utilizing an assessment as a means of establishing a foundation of technology skills among entering college students
may be an integral step for teacher preparation programs seeking to develop tech-savvy educators.

Works Cited


