Evaluating the quality of a graduate educational technology course: How can we increase the instructional quality of a course using technology-based data-driven instructional decision-making tools?

Yesim Yilmazel-Sahin
Second Language Education Program
University of Maryland
United States
ysahin@glue.umd.edu

Abstract: This paper reports on a graduate course taught in a teacher education program in a large U.S. university. A needs-assessment survey pointed out the dearth of technology instruction in this particular program and led to the concept of designing a graduate course that could prepare teachers to become skilled users of instructional technology. The author describes the designed course and explores the issue of instructional quality using technology-based applications for the examination of student data to make informed educational decisions.

Introduction

The increasing trend toward technology-enhanced teaching in the K-12 (kindergarten through 12th grade) schools could dramatically change the face of public education in the U.S. and in other countries, but only if teacher education courses involve technology-enriched instruction. Unfortunately, many teacher education programs fail to model consistent, meaningful, technology-enriched instruction.

What happens when teacher education does not involve learning through technology for teaching candidates? Teachers who have not personally experienced learning with the help of technology during pre-service teacher education are significantly less likely to use technology in their own classroom teaching (Goldberg & Sherwood, 1983; Willis & Raines, 2001). Conversely, pre-service teachers have a significantly more positive attitude toward computers and technology after completing technology-enriched activities and assignments in their teacher education course (Abbott & Faris, 2000) and are therefore more likely to use technology in their own teaching later (Willis & Raines, 2001). The importance of technology in teacher education is emphasized by the "No Child Left Behind" Act, which mandates that 25 percent of states' federally-granted technology funds must go to professional development, i.e., teacher education (www.ed.gov/nclb/landing.jhtml). With that in mind, designing and offering an educational technology course that would prepare our in-service and pre-service teachers to become competent users of technology became one of the priorities of our teacher education program.

Background Of The Course

Several factors led to the decision to design and offer a technology course in order to prepare our teacher education students to use a variety of computer based technologies, investigate new state and national technology initiatives and standards, and learn to develop lesson plans integrating technology with clear instructional objectives. Research mentioned above shows that the best way for teaching candidates to become familiar with and motivated to use instructional technology is for them to experience technology in their own learning during teacher education courses.

It is crucial to identify the learning needs and attitudes of the students in the program before designing an educational technology course, because careful planning is a prerequisite for the effective implementation of technology in education. A small-scale, informal needs assessment was given in the spring semester 2003, by means of a written, 15-item, close-ended survey of 25 teaching candidates, representing about one-third of the student population in the TESOL teacher education program. The survey was aimed at determining students' self-perceived technology competency levels and their needs and interests.

Most of the respondents were pre-service teachers, though some were already teachers. The survey yielded a snapshot of their experiences with instructional technology and provided valuable input for the design of my course. Results revealed that (a) most respondents believed there were no or inadequate technology-training opportunities available to them, (b) they felt less than fully prepared to use technology

Comment:

Comment:

for teaching, and (c) those who were already teaching employed technology primarily for instructional planning rather than for in-class instruction. On the other hand, almost all had access to computers and believed that instructional technology could enhance student learning. Respondents felt that technology would be interesting and motivating, that it would provide access to authentic and meaningful materials, and that it would accommodate different learning styles. Despite a woeful lack of technology training, they were interested in technology.

The planning of the technology course took several months. The design of the course took into consideration the results of the needs assessment because student involvement in course design ensures that content matches student interests, needs, and abilities. During the design process, content experts were consulted and provided valuable feedback.

About the Course

The purpose of EDCI788F Special Topics in Teacher Education: "Integrating Technology into Teaching" was to introduce future and current teachers to instructional technology tools and prepare teachers to become skilled users of instructional technology.

The course was composed of a number of hands-on technology workshops and stressed active learning through in-class use of instructional technology. As a final product, students designed an electronic portfolio that demonstrated technology competencies based on Maryland Teacher Technology Standards.

Student Assessment

In this course student assessment was done formally and informally in a variety of ways. There were 6 major projects to be completed throughout the semester. In addition to regular course sessions, hands-on workshop were presented related to the six major projects. In-class time was given to complete the projects. This allowed for much-needed guidance, and also allowed students who were unsure about the new skills they learned to get help from their peers and the instructor.

An Excel database was developed to collect student data. This database was used in keeping track of student progress as well as in determining assignments, teaching strategies and groupings. Using this database, enabled me to see which students were struggling with which assignments. For instance, it was after I started using this database that I realized in-service teachers had more problems with submitting their assignments on time than pre-service teachers. All of the in-service teacher participants were full time teachers so it would seem as though they would have less time to work on their projects than the full time students did.

I also looked at data to see if there was any correlation between age and achievement in this class. I assumed three age groups (Group A: 20< <30, Group B: 30< <40 and Group C: >40) and grouped students into these three age groups. Interestingly enough, group C students who were older than the students in other age groups were quite successful in this class. However, they needed more guidance and help from me and their peers than any student in groups A and B. Also, they indicated that they constantly received help from people at home such as their kids or their spouses.

Count of Final Grade	Letter Grade			
Age Group	A	A+	B	Grand Total
A	2	4	1	7
B	1	3	2	6
C	1	1		2
Grand Total	4	8	3	15

Table 1

I also conducted Style Analysis Survey (SAS) in my class to find out student learning styles. SAS is created by Rebecca Oxford and is a test that checks your style of learning and working. Using Excel, I converted this survey into an electronic one and asked students to take E-SAS and post their results on WebCT. Survey results revealed that majority of the students were visuals learners. Interestingly, those who achieved highest scores were visual learners. (Table 2)

Count of Learning Style	Letter Grade				
Learning Style	A	A+	B	(blank)	Grand Total
A			1		1
A T	1				1
NA			1		1
V	3	7			10
V A		1			1
VAH			1		1
(blank)					
Grand Total	4	8	3		15

Table 2

Course Evaluation

Improvement in a course will occur continuously over time. The key to improvement and better quality is evaluation. Evaluation is the purposeful gathering and analysis of data to make a judgment on the results or value of some activity. Evaluation requires time and resources, but is essential to improvement.

Although a great deal of time was spent designing this course, I was very well aware of the fact that I needed to modify my course throughout the semester based on student feedback. My purpose was to develop an evaluation framework that I could use to tailor my course as I go along. However, I wanted my decisions to be data-driven, and not based merely on thoughtful decisions. Technology made this possible. Evaluation of my course was both formative and summative.

- **Formative Evaluation**

Student feedback was collected through journal entries throughout the semester and this information was used to shape the course as the semester unfolded. Since students were at different technology proficiency levels, finding the right pace for the class activities and workshops was initially a challenge.

Journal entries opened opportunities for course evaluation, self-evaluation, and personal reflection, all of which I had hoped to encourage. Weekly journals kept students actively involved in class material and channeled their voices. I could hear how each student understood what they were learning. I could give them individual feedback. And though some were not as enthusiastic about keeping a journal as some other students, I did receive thoughtful and insightful writings from most of the students every week.

Based on my students' feedback I made several changes in my course. For instance, when a student indicated that she had a hard time taking notes while following my instructions, I created a "Tips" page where students would find detailed answers to the questions raised in class.

- **Summative Evaluation:**

Summative evaluation usually occurs after the activity has end and is used to make judgments about its success or otherwise.
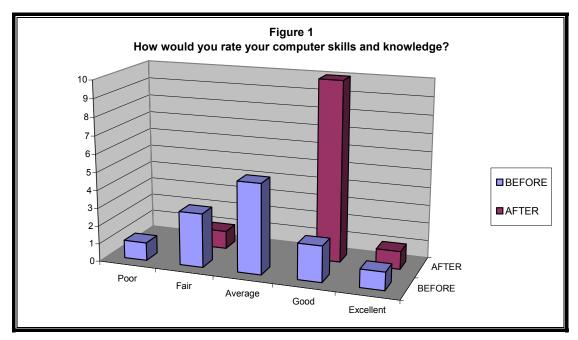
Initially I decided what aspect of the course to evaluate. Then I designed an end-of-the-semester survey to determine what worked and what didn't and which components of the course were more helpful to my students. The survey had both quantitative (close-ended) and qualitative items (open-ended questions). Out of 15 students, 12 students responded to the survey. Students were told that they could put their names on the survey if they wish to but out of 12 students, 8 preferred to remain anonymous.

The procedure:

Before conducting the survey, I gave information to the students about the purpose of the survey, how long it would take and by taking this survey how they can help me improve this course. On the completion of the survey, the data was evaluated. The following tables were created.

Computer Skills And Knowledge

Students were asked to rate their computer skills and knowledge before and after they took this class.

Figure 1
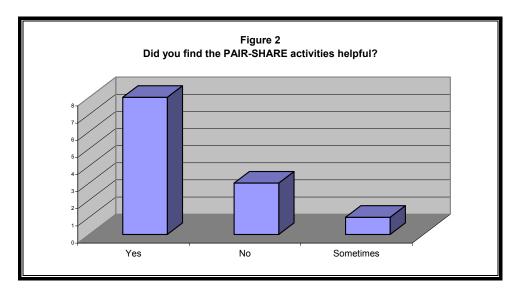**How would you rate your computer skills and knowledge?**

As seen in Figure 1, students who rated their computer skills "fair" (3) and "average" (5), rated their computer skills "good" after taking this course.

When asked whether the hands-on workshops were helpful or not, all of the students indicated that they were very helpful. As expected, students who had different competency levels had different opinions about the amount of instructional support needed.
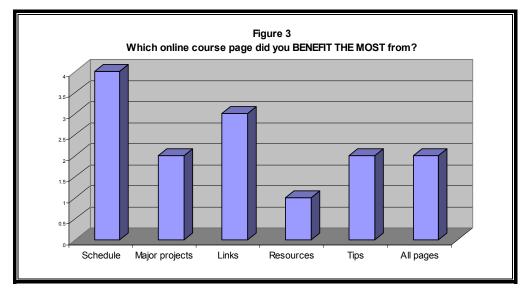
Pair-Share Activities

Throughout the semester, students were asked to share their work with their peers. The purpose of this input exercise was to encourage students to share their work and receive constructive feedback on their work. A checklist was given to each student to evaluate his/her peer's work. As seen in Table 2, 75% of the students found this activity helpful.

Figure 2
Did you find the PAIR-SHARE activities helpful?
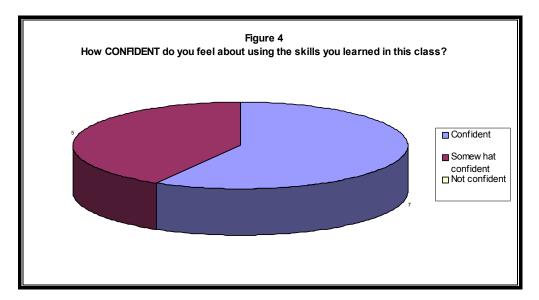
Yes   No   Sometimes

Online Course Website

In addition to using WebCT, I have designed a course website to accompany the content of this course. In designing this course website, I have strived to create clear, simple, user friendly web pages in order to provide students easy access to course materials.

Figure 3
Which online course page did you BENEFIT THE MOST from?

Schedule   Major projects   Links   Resources   Tips   All pages

When asked which online course page was the most useful, most of the students ranked the online schedule page the most beneficial. However survey results showed that having an online course website to accompany the content of the course was very beneficial. *"I loved using all these pages. It was helpful that there was so much info available about how to complete the assignments,"* one student said.

Students also indicated that they felt confident about using the skills they learned in this class. Some said that they would feel more confident with more experience using the skills they learned.

Figure 4
How CONFIDENT do you feel about using the skills you learned in this class?

Legend:
- Confident
- Somewhat confident
- Not confident

Conclusions

Reflecting throughout the semester on what my goals were for this class and what I was able to achieve was very helpful. Tteachers can really learn from students, especially those whose voices they don't want to hear. Involving students in course evaluation is essential to course improvement. Through a course evaluation survey, I found out what understanding, knowledge, and skills my students acquired in my class. In addition, the technology tools I used allowed me to track students' progress over time and modify my course according to my students' needs and interests. They also helped me measure those aspects and outcomes of learning that would otherwise be unattainable without the use of technology. I came to realize that as a teacher, I have better confidence in my decisions when these decisions are data-driven.

Teachers can increase the instructional quality of their courses using data-driven instructional decision-making tools. Technology makes it possible for teachers to collect, analyze student data, and reflect upon the implications of the data to better tailor their instruction. In this way, teachers can make informed decisions about their teaching practices.

References

Abbott, J. A., & Faris, S. E. (2000). Integrating technology into pre-service literacy instruction: A survey of elementary education students' attitudes toward computers. *Journal of Research on Computing in Education*, 33, 2, 149-161.

Bowlin, N. (Personal communication, December 6, 2003).

Goldberg, K., & Sherwood, R. D. (1983). *Microcomputers: A parent's guide*. New York, Wiley.

Department of Education (2001). No Child Left Behind Act. Retrieved September 12, 2003, from http://www.ed.gov/nclb/landing.jhtml?src=fb.

Willis, E. M., & Raines, P. (2001). Technology in secondary teacher education. *T. H. E. Journal (Technological Horizons in Education)*, 29, 2, 54. Retrieved October 1, 2003, from http://www.thejournal.com/magazine/vault/A3638.cfm.

Center for Applied Research in Educational Technology. (2003). Retrieved October 1, 2003, from http://caret.iste.org/index.cfm?fuseaction=evidence&answerID=32#references