Stand-alone Computer Courses in Teachers' IT Training

Should teachers in training learn IT skills through stand-alone computer courses or integrated into methods courses?

By **Yu-mei Wang**

The stand-alone computer course is the earliest IT training model in teacher education. Designed in the early 1980s, the course responded to increasing demands from schools that teachers have adequate technology skills. The primary goal was to improve technology proficiency among preservice teachers.

Research later determined that student teachers and recent graduates continued to have difficulty relating technology to instructional activities and lacked strategies to integrate computers in the curriculum.[1] This result prompted severe criticism of the stand-alone computer course. Computers, it was argued, should not be taught in isolated technology courses but integrated into all education courses, especially methods courses, so that faculty could model the integration of computers in teaching content areas. Advocates of the integrated model assume that students today enter universities with adequate computer skills. With technologically savvy students, the reasoning goes, the stand-alone computer course is not necessary. So which is better for ensuring that preservice teachers learn how to use technology effectively in the classroom? The stand-alone computer course or technology training integrated into methods courses?

In the School of Education at the University of Alabama at Birmingham, education majors must take a stand-alone introductory educational computing course. Students also have opportunities to be exposed to technology uses in methods courses. The level of their exposure depends on the faculty's technology proficiency and belief in the role of technology in teaching and learning. To help the educational computing program provide optimally effective IT training to preservice teachers, the program decided to systematically collect information on the technology proficiency of entering students. A survey administered to all students in the educational computing courses in 2005 asked students to rate their technology proficiency on a scale of 1–5 (1 = poor; 2 = below average; 3 = average; 4 = above average; 5 = advanced). Self-rated proficiency was low, with only e-mail skill rated as above average. Word processing, using Web browsers, and desktop skills were rated average. Students rated their abilities in all other skills (use of spreadsheets, graphics, databases, PowerPoint, Hyperstudio, digital cameras, digital video editing, Web page design, listservs, discussion boards, and troubleshooting) below average.

The survey results contradict the assumption that students enter the teacher education program with adequate computer literacy skills and indicate that the stand-alone computer course should not be dismissed based on false assumptions of student IT skills. Moreover, various factors influence preservice teachers' IT ability and training: the digital divide among incoming students, the learners' cognitive load, and barriers to integrating IT in the education program. These factors must be considered before making a decision on how to train preservice teachers in IT skills.

The Digital Divide

Despite widespread technology use in K–12 schools, computer access is not evenly distributed. A 2003 study found the student-to-computer ratio was higher

in lower socio-economic school districts than in upper-middle class school districts.[2] In addition, children from high-income families or whose parents had more education were likelier to have computers and Internet access than those with parents having limited education or low incomes. Further, the use of computers and the Internet at home was higher among white children than among black and Hispanic children.[3]

Cognitive Load and Student Learning

Students lacking technology skills who are expected to learn them while taking teaching-methods courses often encounter cognitive overload. A high-level cognitive task frequently involves numerous subskills that compete for working memory capacity. Performance of these subskills must become automatic to free memory capacity to concentrate on more complicated aspects of the task. If the learner has to devote a great deal of time to performing the subskills, performance on higher level skills suffers.[4]

The results of two studies implied that student learning was negatively affected when trying to learn teaching methods and technology skills simultaneously. Both studies compared the stand-alone IT approach and the integrated IT approach. In a study by Anderson and Borthwick,[5] one group of students received computer training integrated into a special-education methods course. The other group completed a computer training course and the methods course separately. The results showed that the students who received stand-alone computer training achieved greater improvements not only in their technology capabilities but also in their abilities to teach with computers.

A study by Glazewski, Brush, and Berg[6] produced similar results. One group of students took computer training integrated into a methods course taught at a local school, where they could design and implement teaching lessons with technology in authentic settings. The other group of students completed computer training and a separate methods course on campus. The results of this study showed that preservice teachers in the integrated field-based training felt less prepared in technology integration than the students who took separate courses on campus.

Barriers to Integrated IT

The greatest challenge for the integrated approach is that technology must be thoroughly infused throughout teacher education programs, which is not the case in most institutions. It can be problematic for methods faculty to modify their courses to include technology components without additional training and without a common starting point for entering students. The stand-alone computer course provides a foundation on which methods faculty can build their course work. With the elimination of the stand-alone course, however, this foundation goes away, and methods faculty struggle with questions about how much students know about technology and where they should start.[7] It is difficult for them to plan and design their courses to include technology components without this common base as a reference.

Recommendations

I believe the stand-alone computer course deserves a place in preservice teachers' IT training along with integrated methods courses, despite the drawbacks:

- The technology requirement probably won't fit all incoming students, some of whom might already have the requisite computer skills.
- Technology taught in the stand-alone computer course tends to get disconnected from teaching methods.
- Timing can be problematic. When students take the course too early in the program, they do not have the background needed to relate technology to teaching. If they take the course too late, the lack of technology exposure will impede their progress in other educational courses, especially methods courses.

The following recommendations can remedy or minimize the inherent problems of the stand-alone computer course.

Student Exemptions

Some teacher education programs test preservice teachers' technology proficiency. Students who pass the tests are exempted from taking the computer course. Alternatively, a stand-alone computer course separated into various modules might allow students to test for exemption from taking particular modules. More often than not, student technology proficiency is not evenly distributed. For example, students might be adept with surfing the Internet but know little about spreadsheets.

Learning Technology in Educational Contexts

Learning technology situated in educational contexts can model for students how they might relate technology to teaching. For example, prior to teaching spreadsheet skills, the instructor might demonstrate how to use spreadsheets to teach math concepts, testing hypotheses and generating formulas. Instructors can encourage students to consider how the application might help in teaching various subjects. K–12 school teachers could be invited to demonstrate the use of a particular computer application in teaching a content area.

Course Placement by Division

Pierson and Thompson[8] presented a creative way to align the stand-alone computer course with the education students' curriculum. The program divided the three-credit computer course into three one-credit courses, each designed and offered in coordination with preservice teachers' professional training. The first course teaches basic computer skills during the junior year, while students are taking preprofessional development courses. The second course focuses on integrating technology into teaching. Students learn to design lessons integrating computers while they are taking methods courses so that they can connect technology with teaching content areas. The third course is offered concurrently with student teaching to support teaching with technology in authentic settings. The course uses the Web to deliver instructions.

Conclusion

Both training models—stand-alone computer training and integrated technology education—help preservice teachers become practitioners. The stand-alone

computer course teaches them skills they can apply in integrated training. The integrated methods courses provide students with contexts in which they can practice teaching with computers and reinforce and sharpen their computer skills.

As demand increases for technology-using teachers, teacher education faces the challenge of graduating teachers who are competent to teach in information-age classrooms. If we view the two training models as a learning continuum, we can focus our efforts on improving and perfecting the models to provide optimal IT training to preservice teachers. e

Endnotes

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