

Furnishing Turkish Preservice Teachers with IT Skills: Hope or Hype?

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Abstract: There is a growing demand from the schools that prospective teachers be computer literate. New teachers are expected not only to have necessary skills for using computers but also to use computers effectively to enrich their classroom teaching. These expectations have pressured teacher education institutions in Turkey to redesign their teacher education curricula. In order to respond to these pressures, the Turkish Council of Higher Education (YOK) has developed a new teacher-training curriculum for schools of education in Turkey. According to the new curriculum, a computer literacy course became a must course for all preservice teachers to fulfill the requirements for teaching credential. The main purpose of this study is to introduce and to discuss the efficaciousness of the new preservice technology-training program in Turkey.

Introduction:

Existence of high expectations from the application of new technologies is not new. Ever since people first began to use new tools and innovative methods to extend their own limited abilities, they have been confronted with the need to adapt themselves to create effective working and living environments. Especially, with the advancement of new information technologies, the way people communicate and perform at work has changed dramatically. Not only have the emerging technologies of information made possible new forms of communication and interaction in every aspects of our lives, they have also unleashed strong forces for educational reform. Now, educational institutions are primary responsible for preparing individuals for the new millennium in which IT skills will evidently have a decisive role.

Many researchers in such diverse fields as economics, sociology, organizational psychology, and education have long recognized the importance of information technology for national and institutional development. However, the term "IT" has different meanings and functions for different areas of study. For example, IT in education is perceived as not only a tool to be used for enhancing teaching and learning but may be a change paradigm in the classroom or in the educational system. Over the last three decades, instructional technology has progressed from its early emphasis on the protection and use of media and instruments of communication technology to its current concentration on the systematic approach to solving instructional problems based on theories of learning and instruction (Seels & Richey, 1994). As a result, provision of information technology in education is assessed on the bases of its efficaciousness in providing new ways of learning for both teachers and students. For instance, Means & Olson (1993) reviewed research related to use of technology in the classroom and concluded that technology:

- Often stimulates teachers to present more complex tasks and materials
- Tends to support teachers in becoming coaches rather than dispensers of knowledge
- Provides a safe context for teachers to become learners again and to share their ideas about curriculum and method
- Can motivate students to attempt harder tasks and to take more care in crafting their work
- Adds significance and cultural value to school tasks

Computer Literacy Courses for Teachers:

A number of institutions, organizations and state agencies have attempted to create sets of guidelines to determine what computer skills are necessary (or should be required) for prospective teachers. As a result of these extensive attempts, now a number of different guidelines exists.

Luehrmann, for example claimed that, "One who is truly computer literate must be able to do computing to conceptualize programs algorithmically, to present them in the syntax of a computer language, to identify conceptual bugs, and to express computational ideas with a high degree of organization and readability" (Luehrmann, cited in Troyer, 1988, p.144).

At the other end of the continuum are those who are not in favor of including computer languages and programming into the content of computer literacy courses. Berger & Carlson (1988) criticized current computer literacy courses for heavy concentration on technical information rather than focusing on learning and instructional design theories and methods to integrate computers into the curriculum. They propose a pre-service course that is aimed at teaching the connection between instructional strategies of computer assisted instruction and the theories of learning and instructional design. Similarly, Martorella (1984) predicted that teachers do not need to know computer programming to use computers effectively as an educational tool. That view is shared by Rundall who expressed his opposition to those who are at the other end of the continuum by using the automobile analogy: "We can run a computer, just as we can run an automobile, without knowing how it works" (Rundall, 1985).

Davis (1992) developed a list of outcomes for teacher training that focuses on how to utilize technology in the classroom. Davis believed that a teacher training program should focus on increasing teachers' competencies to utilize technology effectively rather than promoting their programming skills. He further proposed that pre-service teachers should be able to:

- 1) make confident use of a range of software packages and information technology devices appropriate to their subject specialism and age range;
- 2) review critically the relevance of software packages and information technology devices appropriate to their subject specialism and age range and judge the potential value of these in the classroom;
- 3) make constructive use of information technology in their teaching and in particular prepare and put into effect schemes of work incorporating appropriate uses of information technology;
- 4) evaluate the ways in which the use of information technology changes the nature of teaching and learning (Davis, 1992).

Finally, there is an emerging perspective, which tends to view technology as a way of promoting innovations emerging from other fields of education such as curriculum development, instructional design or the theory of learning and teaching. Willis & Mehlinger (1996) think this perspective will frame the decisions and debates of the 1990s because this approach reflects a maturing perspective on educational computing.

It does not treat all uses of computers in the classroom as equal as did so many of the research reviews published in 1980s. In addition, it does not treat educational computing as something separate from other aspects of the classroom such as the curriculum, lesson plans, and instructional design...Although this is very desirable, it will make discussions about computers in the classroom much more complex. (p. 1006)

In light of these different approaches, it is evident that the term "computer literacy" remains an ambiguous term because it means different things to different people. Tremendous development in the computer industry is also making the issue become much more complex. Even though outpacing of technology in teacher education programs has been too slow, the computer industry has been promising and providing more advanced technologies for instructional use simultaneously. Ongoing debate on the definition of "computer literacy" and guidelines for student teachers' computer competencies creates a serious debate on the contents of computer literacy courses. Each scholar determines the content of such courses based on their view of perceiving the term computer literacy resulting in confusion and lack of agreement.

Troyer (1988) reviewed a number of sources giving recommendations for the content of computer education for teachers. He noted that three topics are most frequently recommended for inclusion in teacher computer literacy training: (a) computer operation and structure, (b) educational applications of computers, and (c) software/courseware evaluation. (p. 145). Troyer (1988) also found that early emphasis on knowledge of the basic elements of programming has been losing its attractiveness among the scholars:

Teacher computer literacy training now directs teachers to consider the methods of utilizing the computer effectively in the classroom, to evaluate available software, to use the computer as a tool in accomplishing record-keeping and managerial tasks, and to consider the larger impact of computer technology on society and education. (p. 146)

There is a number of researchers who firmly believe that computer literacy is a matter of individual organizational need. These scholars claim that we should focus on what is important to student teachers rather than pondering the glut of computer skills available. Moont (1987), for example, criticized that we are spending too much time and effort on the definition of computer literacy rather than teaching. Sheffler (1986) summed up the philosophy of computer literacy when he claimed "the challenge confronting teachers is to adapt whatever advantages computer use may be shown to offer, while holding fast to their independent vision of educational values" (Sheffler, cited in, Kay, 1989).

Higdon (1994) claims that each school for teacher training develops its own criteria of proficiency level in computer literacy and these imposed computer proficiency levels are achieved by pre-service teachers for credit but are not necessarily functionally learned. He further proposes that the pre-service teacher needs to be impressed with the social, economical, and cultural factors along with the empowerment that come with computer literacy. (p. 436).

Constructivist theory defines learning as a dynamic and continues process that must be sustained and strengthened by a multiplicity of experiences from which students then construct their own experiences and explanations (Jonassen, 1994). As constructivist approach receives wider acceptance in the field of teacher education, some teacher education institutions attempt to increase the emphasis on experience in the schools and decrease the emphasis on lecture/discussion and computer lab components of the course by promoting student teachers' field experience (Burson, 1995).

Rodriguez (1997), for example, suggested that some of the general guidance in constructivist literature can be applied to technology training for teachers. Rodriguez proposed five constructivist strategies that can be used in technology training. First, he believed that constructivism and cognitivism complement each other and these two approaches should be merged. He further suggested requiring students to exert their mental effort in support of generative learning while providing explicit instructional support to avoid information overload in short-term memory. Second, he emphasized the importance of focusing on learners and their needs. He advocated that keeping students engaged through active participation and maintaining students' sense of relevance concerning course activities are critical. Focusing on the essence is another strategy that Rodriguez proposed. He argued that grasping the essence, students can then literally accomplish more complex tasks with the instructor's guidance, thus developing their understanding as they grapple with more complex problems. Fourth, he advocated that learning under the constructivist view is a communal activity. Even though teacher trainees need time to develop their technological skills on an individual basis, they often enjoy providing informal assistance to each other. Finally, the last strategy concerns reflexivity-learners' awareness of their role in constructing knowledge. He suggested that the instructor's role is to be one of ". . . engaging the student via questioning and prompting so that the student assumes responsibility for acting to solve the problem. Reflection and action, then, support construction of new knowledge" (p. 1309-1311).

Keizer and Wright (1997) describe how a basic computer course should be designed by using constructivist strategies, which are proposed in the previous study. First of all, the researches suggest that the course should be redesigned with a shift from whole-class to small-group instruction, from individual to tutorial instruction, from lecture to coaching, from summative evaluation to performance assessment, and from isolation to cooperative learning. The curriculum should be based on major concepts rather than a long list of objectives; it should focus on competencies rather than meeting externally imposed criteria. The classroom is to be more learner-oriented and less teacher-centered. The basic framework for the course should be changed from large group lecture and individual practice to teaching practice based on coherent themes, reflection, and relevant contextual experiences. Finally, faculty should give students guidance but not step-by-step instruction so that students can explore the computer applications through tutorials at individualized speeds and engage in authentic, real-word projects (p. 210).

It is obvious that the term "computer literacy" and "the content of computer literacy courses" have been modified according to developments in the field of technology and teacher training. In its beginnings, computer literacy addressed an understanding of hardware and software development. The student was expected to know the parts of the computer both internal and external. In addition, the student was required to become conversant in programming languages since it was necessary to know the language to get the computer to do many required tasks. As user-friendly computers and software become more available in education, the term computer literacy became more application oriented. Accordingly, an evolutionary change also took place in outlining the content of computer literacy courses. Computer literacy courses became more application oriented and the learners were prepared to use computers and software rather than to learn how to program them. Finally, computer literacy is now perceived as a tool for teachers to reform the way they teach.

Characteristics of Effective Preservice Technology Training:

Teachers will play a decisive role in how successful the integration of technology will be in education. It is evident that the investment in technology cannot be fully effective unless teachers receive necessary training and support to become fully capable of using these technologies.

A large body of research points out that technology should be integrated across the entire teacher education curriculum to be effective. Most teacher educators admit that one required computer literacy course for educators is of limited value if it is isolated from the rest of the teacher education curriculum (Yildirim, 1999; Yildirim & Kiraz, 1999). For example, Novak & Knowles (1991) examined beginning elementary teachers' use of computers in classroom education. They discovered that computer usage was not emphasized in their first year of teaching experiences because new teachers viewed computers as "extra" and "special," not as general tools to enhance the instructional process. This study supports the position that technology training needs to be integrated into the entire pre-service teacher education program so that pre-service teachers accept it as a means to enhance teaching and learning.

Effective technology training has four common characteristics that can be traced in the literature:

- (a) educational technology training needs to be integrated into the entire teacher education program so that effective technology integration is modeled for pre-service teachers;
- (b) the training should link technology with curriculum;
- (c) the training should provide hands-on practice so that teachers become comfortable with them; and
- (d) the training needs to be in-depth (Dell & Disdier, 1994).

Integration of IT into Preservice Teacher Education Programs in Turkey:

The Turkish Council of Higher Education (YOK) is responsible for the planning, coordination, and supervision of higher education in Turkey. Parallel to the international practices in reforming preservice teacher education for the new millennium, the Turkish Council of Higher Education has developed a new teacher training curricula for schools of education in Turkey. According to the new curricula, a computer literacy course became a must course for all preservice teachers to fulfill the requirements for teaching credential. This new course is designed to improve and enhance teachers' IT skills.

The main purpose of this course is defined in the new curriculum as to teach basic computer skills and introduce teachers to several commonly used computer applications such as word processing, spreadsheets, databases, telecommunications, and presentation programs. However, as described in the curriculum, preparing teachers for the use of these technologies into their classroom teaching is not among the course goals. Even though earlier practices of preservice technology training clearly ascertained that one computer literacy course is not of a high value unless computers are integrated into the whole teacher education program.

Even though this computer specific course is the first attempt at preparing Turkish preservice teachers to use computer technologies in the classroom, this effort should go beyond only training the teachers on basic computer skills. If the Turkish Council of Higher Education is to prepare teachers for the 21st century, the Council should recognize the need for providing other courses concentrating on instructional strategies to promote teaching with the computer in the classroom. In addition to that the content of "Methods of Teaching" courses can be reorganized to introduce new teaching methods including those incorporating the computer. As a result of this reorganization, schools of education will not only be training preservice teachers on technology but they will also be training preservice teachers on teaching with technology.

It is a fact that teachers teach as they have been taught, and it is unlikely that they will integrate computers into the classroom teaching unless they see their faculty using computers to teach. Therefore, it's also of the essence for faculty to promote "teaching with technology" in their classrooms.

Conclusion and Recommendations:

It is obvious that requiring a computer literacy course for preservice teachers to fulfill the requirements for teaching credential is an important step for the Turkish Council of Higher Education. It is because this required computer literacy course will make teachers more at ease with using applications, help them gain more confidence in using computers, increase their awareness of computers and its applications. However, the related literature on the preservice technology training indicates that "teaching with technology" is more than "using technology." Therefore, preservice teacher training programs of Turkey should be reorganized in accordance with the following principles.

- technology should be infused to entire teacher education program,
- technology should be introduced in context, and
- students should experience innovative technology-supported learning environments in their teacher education programs (Davis, 1999).

In order for the Turkish Council of Higher Education to successfully redesign preservice technology training programs, the following recommendations are offered:

1. Even though every preservice teacher is now mandated to take this required computing course, the value of this course is limited unless computers are integrated into the entire teacher education curriculum. Therefore, the Turkish Council of Higher Education should take the initiatives to employ new policies to incorporate technology into teacher education curricula outside of computer literacy or instructional technology courses. One of the most effective policies for incorporating technology into the whole program would be the integration of technology in teaching methods courses.
2. Needless to say, faculty of teacher education programs will play a decisive role in how successful the integration of technology will be in education. Therefore, they should demonstrate their competency and willingness to use technology in teaching. They should be role models for prospective teachers in integrating technology into the classroom teaching.
3. However, faculty of teacher training programs will need constant assistance from the educational technology experts in developing their hardware and software skills. Therefore, the Turkish Council for Higher Education should develop new policies to make this assistance available.

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