ROLE OF ICT IN EDUCATION FOR PRESERVICE SCHOOL TEACHERS

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ABSTRACT

This document is for students in teacher education programs or who are thinking about the possibility of becoming school teachers. The goal is to help you take increased responsibility for your preparation to make effective and appropriate use of Information and Communication Technology (ICT) during your own education and during your teaching career. ICT includes computers, calculators, personal digital assistants, cell telephones, audio and video storage and playback devices, digital still and motion cameras, the Internet (including email and the Web), computer games, computer-assisted instruction, distance learning, and so on. ICT is a powerful change agent. Some of these changes strongly impact curriculum, instruction, and assessment in both precollege and in higher education. This short document focuses on just a few key ideas of how ICT is affecting and will affect you and our educational systems.

INTRODUCTION

Essentially all schools in the United States have Internet connectivity. On average, schools have approximately one microcomputer per 4-5 students. Some schools have acquired enough laptop computers so that they have one for each student. Most schools have one or more computer labs. Many schools have one of more COWS (computers on wheels, a mobile cart containing laptop computers), and many have "pods" of 4-5 computers in each classroom. The quality of computers in schools, as well as the amount of software available, varies immensely.

In addition to the computers in schools, approximately 80 percent of students now have access to a computer at home. Of course, t quality of these home computer systems, as well as their software and connectivity, varies widely.

The typical home in the United States contains a variety of other ICT devices. For example, there is approximately one cell telephone per two people. Other examples include calculators, hand held computer games, iPods and the equivalent product from other companies, DVD and VCR players, TV sets, handheld electronic games, electronic toys, and so on. Our children are growing up in a world where they routinely use ICT devices.

In 1998, the International Society for Technology in Education (ISTE) published the National Educational Technology Standards for Students (NETS-S). These standards or modifications of these standards have been adopted by most states in the United States. ISTE has

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also developed and published National Educational Technology Standards for Teachers. These standards have helped to shape the ICT in education programs of a very large number of teacher education programs throughout the country. Very roughly speaking, these standards say:

1. Preservice teachers should meet the ISTE NETS-S for students completing the 12th grade.

2. Preservice teachers should have ICT knowledge and skills in education that are appropriate to:

    a. working with students who are meeting the ISTE NETS-S for the grade levels the preservice teachers are preparing to teach;

    b. working with ICT in the content, teaching methodologies, and assessment for the discipline areas and grade levels the preservice teachers are preparing to teach.

Many students will read the above material and sort of "bleep over" the statements about standards. Consider an alternative to this. You might ask yourself, "Do I meet the ISTE 12th grade standards for students?" It is easy enough to find out. Just go to http://cnets.iste.org/students/s_profiles.html and browse through the student profiles for various grade levels. You might begin with the profile for grades 3-5. See how well your formalschooling and informal education has prepared you in ICT, relative to the ISTE standards for students. At the current time, the majority of college students do not meet the 8th grade ISTE NETS-S.

The above activity is an example of self-assessment. You can decide for yourself what to do with and about the results. That is, you can take personal responsibility. As you think about this "personal responsibility" situation, think about what you want for the students you teach or will teach. There is substantial research on the effectiveness of children learning to self-assess their work, provide constructive feedback to their peers, taking steadily increasing responsibility for their own learning, and helping their peers to learn.

IDEAS ABOUT ICT

If you become an elementary school teacher, you will teach a number of different disciplines such as language arts (reading, writing, speaking, listening), math (arithmetic, geometry, probability), science, social science, and so on. Note that it is appropriate to talk about adiscipline such as science, or to use the word discipline to refer to individual parts of sciencesuch as astronomy, biology, chemistry, environmental science, and so on.

Your school may have specialists who provide instruction in art, music, and physical education, or you may also have teaching responsibilities in some of these areas. Your school may have a part time or full time ICT specialist, in which case you and this specialist will share

responsibilities in helping your students to meet standards such as the ISTE-S. Many elementary schools do not have an ICT instructional specialist. In these schools, the full responsibility of ICT instruction falls on the shoulders of the regular classroom teachers. In each subject you teach, you will bring to bear your general knowledge and skills in classroom management, teaching, and assessment. You will draw upon your content knowledge in each of the disciplines you teach. Likely, you know much more about some content areas than about other content areas. For example, perhaps you are a skilled writer, but weak in math, or vice versa. Even this very simple type of self-assessment is helpful. Just because you are stronger in one content area and weaker in another does not mean that your students have the same characteristics. Perhaps you need to give extra thought and effort to helping your students learn the content of areas where your content knowledge and skills are relatively weak.

You will find that each discipline you teach has some specific methods of teaching and assessment. For example, teaching writing is different than teaching math. ICT is useful in teaching and learning both writing and math, but the roles of ICT in these two disciplines are significantly different. Thus, during your preservice teacher education program you will need to learn some discipline-specific ICT-related methods of instruction and assessment. In addition, you will need to learn appropriate methods of classroom management, instruction, and assessment to deal with having a pod of Internet-connected computers in your classroom and in working with students in a computer lab.

ROLES OF ICT IN TEACHING AND LEARNING

ICT has brought us both computer-assisted learning (CAL) and distance learning (DL) that can be carried out by use of telecommunications and other ICT. ICT has brought us highly interactive intelligent computer-assisted learning (HIICAL) that can be delivered over the Web. The nature and extent of the available materials, as well as their effectiveness, varies from discipline to discipline.

There has been extensive research on both CAL and DL. The findings have supported a steady increase in the use of these two aids to instruction and learning.

1. In many different subjects and grade levels, CAL helps students learn faster and better, as compared to traditional methods of whole class instruction. Part of the reason for this is that CAL provides a type of individualization of instruction that is not readily achieved by a teacher doing who-class instruction. Another strong point of CAL is that it can provide immediate feedback in a manner that helps a student to self-assess.

2. For many students, DL is as effective or more effective than traditional classroom instruction. Part of the reason for this is that DL can provide students with access to instruction in a time-convenient manner, cover topics

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or full courses that are not conveniently available through traditional instruction, and proceed at a pace that is geared to the personal needs of a student.

In your preservice teacher education program of study, you will take a number of Teaching Methods courses. These courses should provide you with some exposure to discipline-specific CAL and DL materials.

Each time you make use of the Web to find, retrieve, and use information, you are making use of a form of CAL and DL.

ICT IN EDUCATION

This section contains several ideas that are very important to you as a student and as a potential teacher.

Education is a very large and complex field. Different people tend to have considerable differences in opinion about the goals of education. Figure 4 contains a short list of widely accepted goals. You should be aware that there are many more goals; this short list is designed tocapture the underlying essence of many of the goals.

G1. Acquisition and retention of knowledge and skills. G2.

Understanding of one's acquired knowledge and skills.

G3. Active use of one's acquired knowledge and skills. Transfer of learning. Ability to apply one's learning to new settings. Ability to use one's acquired knowledge and skills to analyze and solve novel problems.

G4 To develop the knowledge and skills to be a self-reliant and lifelong learner. This includes learning to learn, learning one's strengths and weaknesses as a learner, and learning to self-assess one's learning.

You have been a student for many years. Thus, you have had the opportunity to view at first-hand how our educational system works to achieve these goals within a variety of different disciplines.

Spend some time thinking about the general goal G2 of understanding the disciplines that you study in school. What does it mean to "understand?" Can a computer system have understanding? You might answer this set of questions by claiming that only a human can have understanding, and thus the answer to the second question in "no." However, you might want to delve into this a little more deeply.

For example, a computerized automatic pilot can fly an airplane. This automatic pilot computer system has a high level of capability within a very narrow area. It does not understand

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flying an airplane in the sense that a human does—but it can do an excellent job of flying an airplane.

CONCLUSION

ICT is a large and rapidly discipline of study. In the K-12 schooling, ICT is both an important discipline in its own right, and a component of each discipline in the curriculum. ICT provides a wide variety of aids to teaching and learning. In addition, ICT provides a variety of aids to problem solving in each discipline. Many states have adopted ICT goals for their students. Success in achieving these goals is highly dependent on the regular classroom teacher, even in schools that happen to have an ICT specialist. Good teachers and good teaching are very important in our school system. However, it is also important for students to learn to take an increasing level of responsibility for their own education. The elementary school students you will teach in the future face a lifetime of rapid change in science and technology. They need to learn to learn and become skilled in the learning needed to deal with such change.

REFERENCES

- Black, Paul and Dylan William (1998) Inside the black box: Raising standards through classroom assessment. Phi Delta Kappan. Accessed 10/30/05: http://www.pdkintl.org/kappan/kbla9810.htm.

- ISTE NETS (n.d.) International Society for Technology in Education NationalEducational Technology Standards. Accessed 9/24/05: http://cnets.iste.org/.

- ISTE SIGTE (June 2005). International Society for Technology in Education Special Interest Group in Teacher Education workshop. Accessed 9/24/05: http://darkwing.uoregon.edu/~moursund/dave/SIG-NECC2005/SIGTE2005.html.

- Moursund, D.G. (2004). Brief introduction to roles of computers in problem solving. Accessed 9/24/05: http://darkwing.uoregon.edu/~moursund/Books/SPSB/index.htm.

- Moursund, D.G. (2005b). Brief introduction to educational implications of artificial intelligence. Accessed 9/25/05

- OTEC (n.d.). Learning theories and transfer of learning. Accessed 11/1/05: http://otec.uoregon.edu/learning_theory.htm.