

IMPLEMENTING TECHNOLOGY INTO THE CLASSROOM

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All of schools in the United States have computers. Thousands of educational software packages are available on the market. The production and sales of CD-ROM and Multimedia instructional materials are booming. Despite these factors, the effective use instructional technology in the classroom is still not as great as researchers and educators have expected and predicted. One process that strengthens the link between hardware and software technologies and their effective use in instruction and learning is the SKILL approach to implementing technology into the classroom.

Implementing technology to achieve a high quality of instruction and learning is no longer the question of "should we," but "how do we." Concern about this issue is increasing at all national, state and local levels.

The United States Department of Education has developed an ambitious national technology plan. According to the plan, the nation must commit itself to achieving three key goals by the year 2000: 1) all 2.9 million teachers in America will have received technology training, 2) all 110,000 schools in the nation will be equipped with computers that are connected to the National Information Infrastructure, and 3) all schools will have access to affordable, high-quality, technology/content based software for achieving high academic standards. The National Council for Accreditation of Teacher Education (NCATE) has identified the use of technology as a fundamental part of the teaching, learning, assessment, evaluation and productivity process.

Governors' support, chancellors' emphasis, and school system administrators' concern have made educational technology an essential topic today. In Georgia, the state lottery has funded education technology centers for training pre-service and in-service teachers in the use of educational technology at selected education sites. Millions of dollars have been spent on the hardware and software. Galileo (Georgia Library Learning On-line) has become available for Georgia students to augment print resources. In addition to Galileo, the most useful portions of US Census data are available on line (Hughes & Bracewell, 1995).

In local schools, more and more computers have entered classrooms. The office of Technology Assessment of the US Congress has reported that all schools in the United States own computers, and that the ratio of computers to students has changed from 1:125 to 1:9 during the last decade (Electronic Learning, 1993; Office of Technology Assessment, 1995). In addition, thousands of educational software packages are on the market and local area networks. Multimedia resources have become readily available for

classroom use. Total school resources for both multimedia hardware and software has reached 10 billion dollars (Thomerson, 1995). However, there exists a lack of linkages between technology and the effective use of technology in education. Strategies for incorporating technology into the classroom learning process need to be further explored.

S-K-I-L-L Approach

The general term "Skill" means ability and dexterity, knowledge, expertness and aptitude, but as an implementation model of using technology in the classroom it has more extensive meanings. "S" stands for SEARCHING; "K" indicates KNOWING, "I" means IMPLEMENTING, "L" signifies LEARNING from, and "L" is for LOOKING ahead.

Searching—The first component of the model is "Searching." To use technology in the classroom, the instructor must know what is available for instruction and learning. The process of searching can start at the school media center. From there, the instructor obtains the information of what hardware and software tools are available in the school. A list of accessible hardware equipment and software packages is a practical and handy resource for the instructor. The next step of searching is to explore free catalogs—most technology vendors are willing to provide these catalogs at no charge. From the huge amount of advertising information, the instructor may select those technologies which may be implemented for classroom instruction and learning. Another way of searching is to consult professional journals. Most of professional journals will have new products reviews. These reviews help instructors comprehend the information about the new products. Searching also includes conducting on line searches. Although searching is a time consuming process, it is a worthwhile endeavor.

Knowing—The second component of the model is "knowing." After completing the search for information, knowledge about instructional technology tools, such as software packages, becomes imperative. In this component, the instructor may request copies of software packages and other media for preview. Previewing enhances the instructor's knowledge of the software packages and improves skills necessary to use technology. Key issues for "knowing" about instructional technology and software packages include evaluating the content accuracy, ease of use, and technical appropriateness. It is important to have the contents of software packages match the curriculum guidelines, to have the level of difficulty of using technology meet students' readiness and to have the technological

features, such as color, sound and animation images, motivate students to learn. The "Searching" component in the SKILL approach provides the instructor with the information on what is available, and the "knowing" component helps the instructor learn what the instructional technology is about.

Implementing—"Implementing" is the third component in the SKILL approach. The purpose of implementing technology is to enhance instruction and learning. Therefore, the implementation of technology should meet the needs of specific instructional objectives. After searching and previewing, the instructor should devise a strategy for using the technology in classroom instruction and learning activities. Considering when, where and how the technology is to be implemented will assist the instructor to outline procedures and activities. Based on these three words, the instructor should identify when the software packages would be appropriate for use in the lesson, determine where they are to be used, and decide how to implement them effectively. In this stage of the process, the instructor uses a software package (or, at times, one or two portions of a package) in a lesson to achieve an objective in the curriculum. The instructor should consider whether the technology should be used for classroom demonstration or by the students, for a group project or individual practice purpose, and if it should be used in lab settings or classroom activity centers.

Learning—The fourth component of the approach is "learning from," representing learning from the students, the environment, and the implementation process itself. Students' achievements of learning can be considered as a scale of the effectiveness of the implementation. From classroom observation and practice, the instructor can gain insights on using technology to teach various concepts and skills, and develop new instructional strategies for designing learning activities. Learning from both students' experience with technology and the implementation process itself, the instructor can improve the use of technology in the classrooms.

Looking—"Looking ahead" is the last, but not least, component in the SKILL approach. "Looking ahead" emphasizes upgrading knowledge and skills, stresses redesigning the implementation strategies, and highlights the reorganizing procedures and activities of using technology in the classrooms. Not only is the technology changing and developing, but student needs are constantly changing. Strategies for using technology in the classroom must be consistently upgraded. Using this process, the instructor makes new plans to improve his or her knowledge and skills for using technology in the classroom, and com-

mences another round of searching, knowing, implementing, learning from and looking ahead.

Dissemination—The SKILL approach functions on a platform of instructor's initiative, administrators' commitment, and community's support. With initiative, the instructor starts exploring every possibility of using technology in the classroom. The instructor searches for information on software packages, getting to know what is available that matches his or her curricula guideline, and begins considering methods of implementation. Based on the implementation, he or she evaluates the effectiveness of using technology by learning from students and the instruction itself, and upgrades the knowledge and skills of using technology by looking ahead

The SKILL model of using technology in the classroom involves the following guidelines:

- implement technology with specific and clear instructional objectives
- emphasize the mastery of learning with an interdisciplinary approach
- integrate implementation strategies with whole class demonstration, group activities and individual practice
- monitor students' learning achievement and keep upgrading the knowledge and skills of using technology in the classroom
- take the cost and effectiveness of using technology into consideration.

Searching, knowing, implementing, learning from and looking ahead represent an unending circle in the SKILL approach. They depend on and are closely related to each other. Using this approach can help bridge the gap between the physical features of technology and the effectiveness of instruction in the classroom. *

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