A New Definition of Computer Literacy


Two major goals of education are to help each student learn some basic facts and skills, and to help each student be a creative thinker and problem solver in using those facts and skills. Over a period of time there have been major changes in both the basic facts to be learned and the skills needed to use these facts. However, for many years there has been agreement that the basics of a good education include a focus on reading and writing, speaking and listening, and representing and solving problems using arithmetic or math. The basics are useful over the full range of human intellectual endeavor.

The basics are fundamental tools, applicable to knowing, doing, and creative problem solving in every academic discipline. Gradually, educational leaders have come to understand that knowing, doing, and creative problem solving are active processes. Because of this increased understanding, for example, many schools now teach "process" writing; in progressive educational systems, there is increased emphasis on process throughout the entire curriculum.

Computer Literacy

Computers are designed to aid in the acquisition, storage, processing, and communication of information. In 1972, Arthur Luehrmann coined the phrase "computer literacy" to help focus attention on computers as an emerging basic of education. During the 1970s, and continuing on even today, many people have suggested that all students need to become computer literate. A number of states and school districts require all their students to satisfy a computer literacy requirement.

The most commonly used definitions of computer literacy have changed over the past 20 years. In 1972 there were few computer facilities in schools and fewer still in homes. The personal computer had not yet been invented. Computer graphics was in its infancy and computer-based multimedia was just beginning to display its potential.

Now, of course, the personal computer has become commonplace in homes and on the job. There is approximately one microcomputer per 12 students in the U.S. public schools, and the number of computers in schools is rapidly increasing. What definition of computer literacy is most appropriate to help guide school restructuring?

Multimedia

One of the goals of education is to help students become better at solving the wide range of problems they encounter or will encounter. Perhaps the most important idea in problem solving is building on the previous work done by oneself and others—for example, using reading, writing, and the other basics.

A great deal of accumulated knowledge is stored in print, audio and video recordings, and film. Gradually the technology has been developed to digitize the information. This makes it much easier to store, process, and transmit this information, particularly using computer technology.
The term "multimedia" is now used to refer to a wide range of computer-based digitized media. With modern microcomputer facilities one can read, create, and edit hypermedia text that includes print, sound, graphics, and motion video.

From this analysis, it follows that computer literacy is a functional level of knowledge and skills in using computers and computer-based multimedia as an aid to communication with oneself and others for the purposes of learning, knowing, and for using one's knowledge.

The goal is for all students to be computer literate at a level consistent with the overall level and content of all of the education they are receiving. This means that students who study varying courses at the secondary school level will develop varying computer and computer-based multimedia knowledge and skills.

**Two Approaches**

Students at all grade levels can develop an appropriate level of computer literacy that is consistent with and supportive of their overall levels of education. Two general approaches are needed:

1. Within each discipline, students need to routinely use the computer and computer-based multimedia tools of the discipline. In studying music, students should learn to use MIDI facilities to compose, edit, and perform music. In studying math, students should learn to use graphics facilities and algebraic symbol manipulation systems to help represent and solve the types of problems being studied.

2. In addition, students need specific, broad-based instruction in computer-based multimedia and in use of computers as an aid to problem solving. Computer literate students are competent in using camcorder, audio and video tape, videodisc, and a broad range of computer facilities to create, edit, and display hypertext documents that incorporate text, sound, and motion graphics. Computer literate students use computer facilities to help solve the types of problems being studied in the courses they are taking. They have learned to represent problems on a computer, make use of procedures and procedural thinking, and know how to test and debug their computer-based problem solving efforts.

The computer-based multimedia definition of computer literacy fits the needs of students being educated for life in our Information Age society. Thus, school restructuring should include a major focus on helping all students to achieve this type of computer literacy.