Lifelong Learning

A Powerful Idea Shaping Education

By David Moursund

This fall, I have been discussing 10 powerful ideas that help shape the present and future of IT in education. Each of these powerful ideas cuts across many disciplines, makes effective use of IT, and has enduring value. This editorial is about lifelong learning —#10 on the powerful ideas list. For the whole list, visit www.iste.org/L&L.

Historically, education has been viewed as a time-limited endeavor. We go to school, we get educated, and then we continue on with our lives. This model worked fine in a time of very slow technological and societal change, but it does not work well now. Lifelong learning is needed because one's limited number of years of formal schooling soon become seriously out of date.

Learning to learn and working toward being an independent, self-sufficient, lifelong learner are now important educational goals. IT is both one of the reasons for this and an aid to accomplishing it.

The Inquisitive, Playful, Fearless Learner

Consider the following scenario. You receive a package containing a new piece of hardware (such as a scanner, digital camera, or modem) or software. Which of the following best describes your approach?

1. Wait until someone else installs the new hardware or software and gives you a personal tutorial in its use.
2. Schedule yourself to attend a workshop that includes detailed step-by-step instructions provided in a hands-on environment.
3. Read the directions and follow a tutorial on how to install and use the new hardware or software.
4. Open the box, take out its contents, plunge right in, begin to experiment, and learn by trial and error.

Most adults take a cautious approach—closer to 1 than to 4—to learning new hardware and software. This is in marked contrast to the way many children see such a learning task. Many children approach new hardware and software in an inquisitive, playful, fearless manner. They explore—they learn by doing. If they are with a group of their peers, they share their learning. Most IT educational leaders feel this is a very good approach.

Wouldn't it be great if all children had this set of learning characteristics, applied them both to IT and to everything else they wanted to learn, and maintained this approach throughout their lives?

This fearless approach suggests two educational goals. First, teachers should provide opportunities for students to

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develop and maintain their naturally inquisitive and exploratory approach to learning new hardware and software. Second, teachers should foster transferring this approach to learning from IT to other fields.

Some Implementation Ideas

1. Time is a precious commodity. Students have only a limited amount of time to learn what they need to know. Thus, educational content needs to be balanced among a variety of learning tasks, such as rote memory of important facts, developing higher-order cognitive and problem-solving skills, and learning to learn. Every lesson teachers prepare and every topic students study should be viewed as an opportunity for students to make progress toward these learning goals. Examine several of the lesson plans you have recently used. For each, estimate the percentage of student effort you feel was directed toward:

   - rote memory of facts,
   - developing higher-order cognitive and problem-solving skills, and
   - learning to learn and to become an independent, self-sufficient learner.

   Then discuss these three general areas of content with your students and have them make similar percentage estimates for several of your lessons. Discuss the results with your students. With your class, brainstorm ways to change these percentages so students receive a better education.
2. Routinely bring new pieces of software into your classroom. (This activity assumes that you have one or more computers for student use in your classroom. It can be modified to work in a computer lab.) As time and computer access allow, a student takes a new piece of software, installs it on the computer, and learns to use the software. The student then deinstalls the software and writes a brief report on the learning experience. This report focuses on the learning approach used, successes and failures, and insights gained—especially insights about learning. This same activity can be used with hardware.
   a. An excellent variation is to have the learner facilitate another student in learning to use the new piece of hardware or software. This "each-one-teach-one" approach is an effective instructional model. In addition, it can increase a student's motivation to learn, because he or she will have to learn well enough to teach a peer.
   b. Direct the student to a computer in which the hardware or software is not working correctly. (You have deliberately "damaged" it in some way, such as unplugging a power cord or connector, changing the preferences on the software, moving a frequently used application into a different folder or removing it from the computer, and so on.) The student attempts to deal with the problem and then writes an introspective report focused on the learning experience.
3. Take a look at the menu options in any relatively sophisticated software application such as a word-processing or graphics program. There may be dozens of options, and many of these may have suboptions. In total, there may be hundreds of different settings, choices, and options—enough so that a person seldom masters all of them. A student can be directed to explore one of the options, learn some uses, help a fellow student learn it, and write about the overall learning experience.
4. Every few weeks, have every student do a "Learn on Your Own" assignment. A student selects a topic and develops an initial level of knowledge, skill, and expertise on that topic. Students set their own learning goals and self-assess. They write a report on each of their learning projects, with major focus on what they are learning about themselves as learners and the overall learning and self-assessment process. Some variations:
   a. Develop a barrel of learning challenges. Seed the barrel with a number of slips of paper that briefly describe a topic, problem, or learning task. Students who are unable or unwilling to define a learning task for themselves can pull a random topic from the barrel. Students who develop their own learning challenges get to add them to the barrel.
   b. In addition to writing about one's learning experience, require each student to teach a small group of students about what has been learned—both about the area being studied and about learning.
5. Browse the Web (or have your students do so) to find tutorials suitable for use by your students. Periodically (every few weeks), each student uses a tutorial to accomplish a learning task. The students are to self-assess the nature and extent of their learning and report on what they have learned about their own learning. This same activity can be used with computer-assisted learning tutorials available on disks and CD-ROMs.

Lifelong Learning in *Your* Classroom

What do you do to help your students learn to be independent, self-sufficient, lifelong learners? Please e-mail me some of your most successful practices. ■

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Online Supplement

Ten Powerful Ideas Shaping the Present and Future of IT in Education

By David Moursund

In the September 1999 issue of L&L, *I listed 10 powerful ideas that are helping shape the present and future of information technology (IT) in education. Each of these powerful ideas cuts across many disciplines, makes effective use of IT, and has enduring value.*

1. ***Connectivity.*** IT has facilitated the development of a Global Digital Library as well as other huge databases that are in routine use, and IT aids in communication among people. The world is being changed by communication systems that cut across national boundaries. Mobile computing is making access possible anywhere, anytime to information and to people. This supports increased educational emphasis on understanding and on library research skills, as compared to rote memory.
2. ***Information appliances*** (Norman, 1998). We are still in the early stages of a megatrend toward computers becoming invisible—much in the same way that electric motors are built into all kinds of appliances and are no longer emphasized. When a technology reaches the appliance stage, the focus switches from learning the technology to learning to solve problems and accomplish tasks using the appliance.
3. ***Effective procedure.*** An effective procedure is a detailed step-by-step set of instructions that can be mechanically interpreted and carried out by a specified agent, such as a computer or automated equipment. Procedural thinking includes developing, representing, testing, and debugging procedures.
4. ***User interface.*** We all understand the significance of the development of the graphical user interface that includes the mouse. We are just at the beginnings of routine use of voice and virtual reality as part of the human/machine interface.
5. ***IT as integral part of the content of non-IT disciplines.*** Logan (1995) points out that IT is a language that cuts across all disciplines and is increasingly part of the content of various disciplines. Examples include spreadsheets, geographic information systems, computer-aided design, and mathematics systems such as Mathematica and Maple. This trend means that each discipline-oriented teacher needs to have an increasing amount of knowledge of roles of IT in knowing and doing the discipline.
6. ***IT-assisted problem solving.*** One of the most useful strategies in problem solving is breaking big problems into smaller, more manageable subproblems. Increasingly, IT is a tool that can solve these subproblems—thus, greatly increasing the problem-solving capabilities of computer users.
7. ***Modeling and simulation.*** The 1998 Nobel Prize in chemistry was awarded to two computational chemists. Computer-based modeling and simulation are now powerful aids to knowing and doing all of the sciences as well as many other disciplines such as economics and business. For example, a spreadsheet is now a

routine aid to developing business models.

8. ***Communication in Cyberspace.*** This includes desktop publishing, desktop presentation, e-mail, videoconferencing, and interactive hypermedia. IT has opened up entirely new ways to communicate in both synchronous and asynchronous modes that include text, graphics, sound, color, and video.
9. ***Empowering students through project-based learning (PBL).*** IT is a powerful aid to doing the work on a project and to representing the results of this work. PBL is an excellent vehicle for implementing constructivism, cooperative learning, and collaborative problem solving (Papert, 1980; Moursund, 1999).
10. ***Lifelong learning—anywhere, anytime.*** IT has added new dimensions to learning, such as distance learning, computer-assisted learning, intelligent computer-assisted instruction, and learner-centered software. Progress in learning theory, brain theory, and artificial intelligence is being incorporated in software that is designed to help people learn—often in a "just-in-time" environment.

References

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