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Research Paper

"How technology can enhance students' learning"

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How Technology can enhance students' learning

Living in the technology world, teachers cannot avoid seeing or encountering computers everywhere around them. There are two choices they can make. It is either to accept it or reject it. Attached to the word "TEACHER" is the hidden accountability of the success in life of students. How can teachers make difference in teaching through technology? This paper will present, from a human being and students' learning style point of view, how computer can enhance students' learning.

From 1980 there have only been about one million computers that existed in the world. But in 1982, one computer manufacturer alone could produce one million computers in one year. Considering that the first electronic computer was produced in 1945. By the end of this decade, the number of people employed in the main types of computer occupations will have grown more than 50% (Schmidt, 1982). With these facts, can we admit that the computer is having a great impact on our society?

What about the computer in education, especially in instruction? What will be the role of computer in school and in classroom? Alfred Bork (1979), a Physics professor at the University of California at Irvine who has done pioneering work with educational computers, sees computer becomes "the major

way of learning at all levels, and learning in almost all subject areas will be through the interactive use of computers". Is that obvious today that computer has become an instrument of learning?

We believe that all human beings have traits of individuality, rationality, effectiveness, and responsiveness. We will examine each of these traits in turn to see how they might be enhanced by the computer.

Individuality

All students do not learn at the same rate and the conventional classroom instruction cannot count credit for this fact, but the computer can. With the computer students can pace themselves. They can spend time with material that they need more time to absorb or they can speed through material that they understand. With the computer students can be allowed choice regarding the path they take through a lesson and the format in which they study in. In conventional instruction, the teacher might use different examples from quarter to quarter in a subject, or might teach the subject in a different manner each time, but the students could only experience it in one way during any given quarter. However, with the computer, teacher could approach students in a number of options to the same material.

Some educators are worried that the computer might promote social isolation since there is no human interaction involved. This concern does not seem realistic. Consider these questions. Chatting, whom do students chat with? What about the technology of web cam? Students can make friends with someone at another country through web cam and chat room on the web site. Is this social isolation?

Individuality involves the time and place for instruction. Instead of being restricted to a scheduled time and place, as in traditional classroom instruction, the student could use computer to study at any locations. In some schools, there is wireless network system where students who have laptop can choose the location of their choice to study.

Rationality

Computers are valuable tools for teaching students how to think. In order to program a computer, take html coding for instance, a student must begin by schematically outlining the steps for the operation which the computer is to perform. Then the student must decide how to code these steps into lines of instruction in a language which the computer can understand. All of this involves the use of the problem-solving method or, to put it more simply, logical thinking. This does not mean an exercise in abstract theorizing. The student is involved with solving a concrete programming problem. If it is true, as educators have

claimed, that students learn by using a combination of thinking and doing, then the computer is a most efficient tool for helping students to sharpen their intellectual skills.

There is an old story that says: give someone a fish and they will eat for a day, but teach someone how to fish and they will eat for a lifetime. I believe that a similar situation can be applied in teaching. Not only give students fish (information) in classroom, teach them how to fish for information through technology as well.

Effectiveness

Effectiveness, as used here, means the quality of possessing emotions. It is this human quality which gives rise to the educational concerns of interest and motivation. Clearly, the computer is a good motivator. Many teachers regularly allow students to use computer as a means of reward. What is it about the computer which motivates students so highly? One thing seems to be its ability to involve students. It appeals to a number of the senses, most often those of sight, touch, and sound. In particular, the graphics capability of the computer is a powerful motivator. If a picture is worth a thousand words, and if many students are more visually oriented than aurally oriented, then it is easy to see why this aspect of the computer is so engaging. Moreover, computer graphics are not static

as in a book. They can be drawn by the computer as the student watches. It is this dynamic aspect of the computer which is one of its most appealing features.

Responsiveness

It has been said that learning is an active process. The teacher can teach all day, but if there is no response on the part of the student then no learning will take place. In the traditional classroom, it is possible for the student to avoid listening to teacher, but on the computer it is not. The student must enter a response through the computer terminal at critical points in the program or else the program will not proceed.

Another aspect of responsiveness on the computer is that the student gets immediate feedback on his or her answers. In giving tests on the computer, incorrect answers can be immediately remedied. This allows testing to become a learning process for the student, rather than simply an evaluation process so that the instructor can arrive at a grade. Also, correct answers can be immediately reinforced and the student can be psychologically rewarded and encouraged to continue. Whether the answers are correct or incorrect, the student's response is instantly evaluated and immediate branching is possible to either remedial or advanced material consistent with the student's demonstrated ability.

The solution of computer-posed problems on a step-by-step basis also allows the student to obtain information for a response as he or she sees the need for it, instead of having the information provided all at once ahead of time in a lecture mode when the significance of the information might not be appreciated by the student.

Besides human traits that can be enhanced by computer, let's take look at learning style of students and see how these styles can also be enhanced by computer.

Multiple Intelligence and Learning Styles

Parents are naturally interested in their child's education and learning style. Teachers are constantly searching for ways to enhance their curriculum. Whether it is in the home or in the classroom, both parents and teachers want to teach children effectively.

To teach more effectively and efficiently we need to find out about Multiple Intelligences and Learning Styles, and what they can mean for the education of the children.

Multiple Intelligence (MI) Theory recognizes that intelligence can come in many forms. Developed by renowned educational psychologist, Dr. Howard Gardner, MI Theory extends our conventional notions of the gifted child by outlining seven kinds of intelligence in any (one or more) of which a child may excel: linguistic, musical, logical/mathematical, visual/spatial, bodily/kinesthetic, intrapersonal and interpersonal.

Each of these intelligences is briefly described based on Howard Gardner's MI Theory below:

Linguistic intelligence -- sensitivity to the meaning of words, grammar rules and the function of language as in writing an essay;

Musical intelligence -- ability to hear tones, rhythms and musical patterns, pitch and timbre, as in composing a symphony;

Logical / mathematical intelligence -- ability to see relationships between objects and solve problems, as in calculus and engineering;

Visual / Spatial intelligence -- ability to perceive and mimic objects in different forms or contexts, as in miming or impressionist painting;

Bodily / kinesthetic intelligence -- using the body, perceptual and motor systems in the brain to solve a problem, as in catching a ball;

Intrapersonal intelligence -- ability to understand and define inner feelings, as in poetry and therapy; and

Interpersonal intelligence -- sensitivity to the actions, moods and feelings of others, as in teaching, parenting and politicking.

These, in turn, can affect how a child learns; central to Dr. Gardner's theory is that every child has his or her own learning style (Gardner 1993).

Multiple Intelligences and Technology

Schools and parents know the importance of technology in education. Teachers in schools and parents at homes can use computers to enhance their children's education and to develop important computer skills. But we must consider if the technology meets the needs of different learning styles?

Technology does meet the needs of various learning styles.

The multiple intelligences can be enhanced with the use of technology. Following Howard Gardner's theory of multiple intelligences, teachers can encourage development by providing enrichment opportunities in each of the areas of the intellect.

Integrating Technology in Multiple Intelligences

Linguistic: Use of word processing programs can help teach language, writing, editing, and rewriting skills. Also the Internet is a valuable tool in learning. Through e-mail children can improve their language skills as well. Other applications children may benefit from are:

1. Word processors with voice annotations.

2. Desktop publishing programs.

3. Programs that allow children to create stories, poems, essays, etc.

4. Multimedia authoring.

5. Videodiscs to create presentations.

6. Using tape recorders.

Logical-Mathematical: Computer programs that teach logic and critical thinking skills. These are also in game formats that could motivate children. Math programs that allows drilling and practicing. Database programs that help explore and organize data and information. Other applications children may benefit from:

1. Problem solving software

2. Computer Aided design programs (AutoCAD)

3. Strategy game software

4. Graphing calculators

5. Multimedia authoring programs (micromedia autoware)

6. Spreadsheet programs

Visual/Spatial: Graphics programs that help develop creativity and visual skills. Also browsing the Internet, organizing files, folders will develop some spatial understanding. Other applications children may benefit from are:

1. Draw programs (CorelDraw)

2. Image composing programs (image composer)

3. Paint programs (Photoshop, Microsoft paint)

4. Reading programs with visual clues (speed reading software)

5. Web page programs (Dreamweaver, MS FrontPage)

6. 3D software

7. Software games

8. Spreadsheet programs which allow children to see charts, maps or diagrams

9. Multimedia authoring programs (Sony Vegas or other multimedia software)

Musical: programs that help write or play music.

1. Music composing software (Finale, Sonar Cakewalk)

2. Videodisc player

3. Programs integrating stories with songs and instruments

4. Reading programs which relate letter/sound with music

5. Programs which allow children to create their own music

6. CD-ROMs about music and instruments

7. Audio CDs

8. Tape recorders

9. Word processors (to write about a movie or song)

Bodily-Kinesthetic: Using computers will help develop hand-eye coordination. Working with a computer will allow children to become involved in their learning, actively. Other applications children may benefit from are:

1. Software games that allow contact with the keyboard, mouse, joystick and other devices.

2. Programs that allow children to move objects around the screen.

3. Word processing programs

4. Animation programs

Interpersonal: Students can work in groups of two to four on the computers. Working in groups will strengthen children's communication and cooperation skills. Applications children may benefit from are:

1. Computer games which requires two or more persons

2. Programs that allow creating group presentations (PowerPoint)

3. Telecommunication programs

4. E-mail

5. Distance education

6. Chat to discuss ideas

7. Help others with any programs

Intrapersonal: The computer can help children build up individual skills. It allows for differences in children's learning styles and abilities. Children may work on their own pace with computers. Applications children may benefit from are:

1. Any programs which allow children to work independently.

2. Games involving only one person.

3. Brainstorming or problem solving software.

4. Instructional games

5. Word processors for journaling and recording feelings

6. Developing multimedia portfolio

7. Video editing (Adobe Premier, Ulead, Sony Vegas)

We all learn in different ways. Teachers need to try to meet the needs of all children by providing a variety of lessons using various teaching methods. When integrating technology in lessons, teachers have to make sure to remember the needs of all the learners and use various methods and techniques. Using software can develop the potential of all children.

Conclusion

If the computer fits in so well with human traits and learning styles, then why are some teachers wary of it? Maybe because some teachers have themselves been highly successful under the traditional instructional system and hence tend to react to what they suspect might make for radical changes in this system. The computer may indeed make for some radical changes, but if these changes will result in more effective learning and a more humanized style of education then the computer is not to be feared.

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