Computer Technology: Possibilities and Pitfalls

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In this article, the authors present contrasting positions on the use of technology in the classroom. The objective is to develop a critical understanding about the pedagogical use and cultural impact of multifunctional technology being used to optimize student learning in the 21st century. On one hand, the article points to potential isolation and alienation due to lack of peer interaction as a result of excessive computer dependence. On the other hand, it acknowledges the potential for using technology to enhance multiple learning skills among learners through adept implementation of technology-based activities. This is a timely reminder of educators’ obligations in making teaching relevant, through the use of advanced techniques in both technological and pedagogical approaches in education.

by Mark Bennett and Marianna Parise

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Computers have become integrated into our world for better or worse. Whether for games or communicating, we have computerized our cultural practices to a degree that will bear social consequences for our future. If we may call this vision a newly innovative “Science Non-Fiction,” it certainly bears scrutiny in terms of education for our children. With professional respect for each other, can two teachers coalesce an effective practice for computer use inside the classroom? With contrasting opinions on computer technology, the authors of this article articulate their respective positions on this subject in the hope of refining the purpose of technology in schools today. Many educators are very enthusiastic about computer use in the classroom. Like all new concepts, however, teachers need to come together to discuss how to achieve the most positive effects for all students. In the final part of this article, the authors unite their arguments to develop a critical understanding about how computers may optimize student learning in the 21st century.

One View of Computer Technology: A Dynamic New Literacy for Students

It is important to remember that teachers do not set cultural trends—society does. We cannot simply ignore options that allow computer technology to be a positive educational tool for use in our classrooms today. As teachers, we must become literate in programs and applications that provide effective pedagogy for student learning. Without question, computers have become as much an integral part of our education system as pencils, papers, and manipulatives.

If any technology ought to be considered an obsolete relic from the past, it is the chalkboard. Tools such as Promethean and Smart Boards provide an interactive way to strengthen and garner knowledge for students in many accessible ways. In addition, the Promethean board augments three key learning styles in students: visual, auditory, and tactile. It invites active engagement for students through sounds, graphics, interaction with the board using a digital pen, and Activotes, which are hand-held devices that allow students to key in their responses to multiple-choice questions. This technology gives teachers and students instant feedback to check for understanding. It is no accident that the technology mirrors a skill necessary for student success due to the format of standardized testing.

In addition, special education consultants note the value of computer software such as Kurzweil, Word Q and Speak Q, as well as Inspiration (Envision Technology, 2012). These programs provide students with assistance on an array of needs, ranging from organizational skills, decoding words, fluency, and overcoming challenges with fine motor skills. Programs such as Kurzweil, for example, provide students who have decoding challenges the opportunity to make a connection between the auditory support system and their understanding of phonemic and phonological awareness, using a visual and auditory tracking medium.

Multifunctional technology clearly helps bring another dimension to a student’s learning experience. Programs such as Word Q provide opportunities for students to use technology that compensates for areas where they require improvement in skills. Computer literacy enables students to experience the revision process in a seamless manner, offering the ability to add, remove, delete, and/or modify written texts without having to rewrite the entire piece. With meaningful pedagogy, student productivity is more likely to increase with the use of such computer technology. Educators must assume the challenge to ensure the new tools of computer literacy are fulfilling students’ learning objectives.

Another View on Computer Technology: Concern for a New Literacy

It would be naive to welcome the age of computer technology in the classroom without any examination of its consequences to pedagogy and students. While it would be dismissive to disregard these technical advances, we need to question their cultural impact on students.
Creating Self-Awareness for Knowledge-Based and Critical Thinking

This diagram represents the three key areas for student success (center of the circle). The middle layer reflects the skills and strategies required to achieve success. The outer layer of the circle denotes an approximation of time required for each section: the interpersonal, the introspective, and knowledge-based. Each section mirrors the amount of time necessary for students to achieve their cognitive and metacognitive optimum.

1. Interpersonal (Group Work)
   Giving students the opportunity to develop their multisensory stimuli for verbal and non-verbal cues.

2. Introspective (Individual)
   The ability to develop self-awareness through self-regulation.

3. Knowledge-Based (Group & Individual)
   The ability to be goal-oriented for success.
so that we may safeguard their pedagogical use for optimum learning. Computer technology must be acknowledged as a potential detriment if used unwisely.

Does the culture of our computer age afford for critical thinkers? Paul Virilio, a cultural theorist known for his concept of “dromology,” has seen a dramatic change in the pace of our lives. From a historical perspective, the rhythms of time used to pulse for us at a slower speed, setting a tempo in accordance to the seasons of planting and harvest (Virilio, 2012). It is only in recent history that we have become so habituated to haste that our time has become an arrhythmic acceleration, and opportunities for reflection are threatened. Computer technology is not immune to this cultural phenomenon. Our times have, in effect, become a culture of acceleration. Learners have been acculturated to the instant gratification of results as experienced in computer games, and so are impatient about assignments that require the luxury of time for creative and critical thinking. Accustomed to a rhythm of time that outpaces any meaningful contemplation, students become only retainers of knowledge as opposed to discriminating thinkers who use knowledge for a purpose. (See Figure 1.)

Computer technology fails to recognize the kinesthetic learner, one of the key learning styles that initiate success for learning. Our bodies navigate actions from which we can draw meaning. Use of manipulatives in mathematics often involves physical actions as students process core concepts from the curriculum. In writing, the simple gesture of a student’s finger attempting to spell a new word in the air signifies movement toward new understanding. Such motions may be self-motivated, a strategy indicating a creative mind at the task of problem-solving. A good teacher identifies their students’ learning challenges evident in those capricious moments to help their students understand the necessary verbal and nonverbal cues to create meaning. These opportunities would be lost in dependence on technology.

Although computer technology effectively disseminates knowledge, we must examine the cultural impact it has on the learner. With greater frequency, we are seeing students learning in a vacuum and an environment that diminishes interpersonal skills. A large part of students’ recreational hours is spent playing computer games or texting friends through the detachment of an electronic device. The isolation of a computer screen at school will only continue to boost an egocentric attitude from learners whose problem-solving and cooperative skills will be no match for the world’s challenges.

We must ask whether we are placing too much emphasis on computerized support for students receiving special education, at the risk of alienation from peers and thus detract from their social and academic development. The very essence of intelligence is, after all, a process by which students engage in opportunities to respond and adapt to multifaceted challenges based on their knowledge of the world. Onscreen techniques that merely accommodate rote skills, simplifying access to information alone, can never substitute for students’ genetic inheritance of cognition.

Student research used to be a visit to the library on a Saturday. There, students would have the opportunity to explore facts for an assignment. Silence in a library meant more than respect for other individuals at study. Its shelves held hallowed volumes of knowledge waiting to be explored. Readers enjoyed the touch of books as they satisfied curiosity that exceeded the parameters of a simple assignment. Educators’ true obligation to students is to support curiosity through analysis of facts, not to support knowledge-based computer programs requiring only rote learning from memorization.

**Conclusion**

Computers are effective devices in the classroom as long as teachers exercise a wise adeptness over the technology (Hopkins,
2004). The creativity and expertise of educators as they initiate the strategies of this technology will determine its ultimate success. In effect, we must be the ones who control its results. The word “technology” comes from the Greek term “techne,” meaning know-how or skill. With a Smart or Promethean Board’s ability to enhance auditory, visual, and tactile learning skills, teachers must oversee the activities of this technology to ensure curriculum expectations come to fruition.

How might we use this technology effectively? Consideration must be given to the development of interpersonal skills to complement any computer advancements. It is not necessary, for example, for every student to have a computer. If we pair two students to a single computer, we give these individuals the opportunity to exercise the skill of cooperation. Teachers need to develop assignments involving metacognitive function—promoting a process that evolves from knowledge-based questions to analysis, synthesis, and evaluation of concepts. There is no doubt that computer technology embraces many elements to help students ascertain knowledge (areas especially pertinent to the progress of students receiving special education services). However, without teacher attention to academic and social issues such as self-regulatory skills involving the “whole” child, there will be no optimization of all skills or students’ physical and psychological well-being.

We have witnessed many youth today who are unable to organize their own games at recess or play cooperatively among peers. To make team sports possible for students, it seems supervisors must become the technology—the “know-how”—to make collaboration possible. If educators are not careful with the use of computers, we risk a perception that the skill to master this new literacy is in itself the final objective, a self-containing knowledge that reaches no understanding between the world and their holistic development. A student’s curiosity must extend beyond proficiency of computer software and into critical thinking.

Educators have to be part of the equation. To reinvigorate the pedagogical practices of higher thinking of the past to make the most of the technology of the 21st century, teachers must become conversant with these revolutionary programs. No doubt, programs at teachers’ colleges will need to be revamped so that our future teachers will feel comfortable with the positive initiatives offered by computer software. However, another crucial element will be ongoing training for school boards on new initiatives in this field to match the educators’ competence and thereby work to meet these objectives well into the future. Furthermore, schools should be encouraged to work in collaboration with technology professionals from the business community, such as Fair Chance Learning and Vocal Links, to augment these skills. With a keen awareness and discriminating mind for improvement in student outcomes, teachers will continue to make favorable strides for their learners in the advance of sound pedagogy (Hargreaves & Shirley, 2009).

In summary, we ought to exercise caution when moving forward with computer technology. Its true value only constructs a research mechanism for sharing knowledge. Unlike television or video programs from the past, the programmed screen often reflects an image unique to our times, that of ourselves in self-absorption with little room for other perspectives. A computer screen’s lure to display one’s narcissism, however, enlightens no mind on matters of culture. More than facts itself, educators have an obligation to interrelate a learner’s knowledge with an awareness that will promote their fulfillment in society.

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References