Book Review

Computers and Education in the 21st Century:
Ortega, Manuel & Bravo, Jose (Editors)

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Since the impetus of the counter-culture revolution in America in the 1960’s led to the development of the personal desktop computer, there has been an ongoing debate about just how to use this wonderful electronic tool in the classroom. In the early years, the work of Seymour Papert, especially, led educators to believe that students should learn how to program this unique machine and use it to discover the solutions to otherwise elusive and complex problems. The discipline involved in programming would help develop widely applicable cognitive and intellectual skills and uncover mathematical relationships and logic that could be applied in other areas of study. This view of the computer was based on the belief that knowledge is derived from a series of logical assumptions and all one had to do was uncover the mathematical relationships to reveal the solutions to the problems and gain mastery over the tool and its applications.

In its infancy, the computer found a home in the Mathematics and Business Studies classrooms in secondary schools and the science labs of universities around the world. In time, given the widespread impact this invention was having in the fields of industry, commerce, communications, publishing and so forth, every level of education’s jurisdiction was under the gun to acquire and implement its use throughout their institutions of learning. From kindergarten to post-graduate programs, the computer was becoming ubiquitous. But many teachers charged with the responsibility of integrating instruction with the computer had few ideas how it might fit into their program and many of its assumed benefits, therefore, were still beyond the naive user.

Before long, however, and at the same time as the above mentioned integration of computer technology throughout society, the development of the first graphical user interface and the spread of the World Wide Web, led to a view of the computer in educational settings that was, in many ways diametrically opposed to that earliest vision. The GUI enabled the general user to interact with the computer in a way far different from that of the highly specialized computer programmer or those individuals who were able to
master the intricacies of DOS and its various applications. The surge in the number of entry points to the Internet and its convergence with access through a GUI browser made necessary a deeper and more profoundly liberating look at how exactly to use this tool in education and what its impact would be on the curricula of the future. Many educators who specialized in pedagogy began to advocate the use of the computer as a tool, fully integrated into all classrooms and used as just one component in the educational endeavour. As a direct result of this development, pressure was increased to not only acquire more of the technology but to better adapt and use it. In addition, questions were raised as to how education might be restructured to further take advantage of the benefits that were advocated solely because of computer use.

Now, at the dawn of the 21st Century, an inordinate number of books and journal articles deal with the implementation and integration of Information and Communications Technologies (I.C.T.) in classrooms at all levels of the educational endeavour. ICT in Education has become big business and yet we still have not come to an exact understanding of just where this fits with the curriculum currently being delivered in schools. In addition, we have yet to refine and better define not only how schools and computers should go together, but what their impact will have on the nature of learning and the quality of the students who graduate from schools of all kinds.

In reading Manuel Ortega’s and Jose Bravo’s book entitled Computers and Education in the 21st Century, one gets a very technically laden view of what classrooms in the future will look like and what the nature of the student-teacher relationship will be. This is not to say that this particular collection of articles does not represent a significant contribution to one aspect of the interface between education and curriculum delivery. However, it seems to dwell on the more technically oriented issues that may have inherent appeal to programmers and software specialists. If classroom teacher are looking for pedagogical techniques and the use of technology for enhanced delivery in the classroom they will not find many in the contained papers.

Again, it is important to say that if one’s interests lie specifically in Computer Science and Engineering, then there are many concepts and possible techniques that are explored by the authors. However, because of the highly specialized vocabulary and technical details, these particular articles do not seem to have been written for educators but rather the technicians who support their classrooms and the entrepreneurs who might seek to develop products that would find a place in the educational market.

Taken as a whole, they clearly describe various software utilities and concepts that might, in the not too distant future, become readily available for use in schools. For example, exciting products are described and examined that could enable imaginative interactive Language, Mathematics and Physics instruction in constructivist, learner centred elementary or secondary schools. However, nowhere, in any of these several articles do instructors receive strategies that would assist them to develop more effective lessons in subject areas except for some discussion about the design of Computer Assisted Instruction. In these papers, the authors implicitly suggest that instructors are capable of tweaking software, so that the problems posed are adjustable to various levels of ability and approaches to enhance student learning. It cannot be assumed that all instructors only have to reduce language instruction to a series of rules, appropriately program the