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Multimedia Learning Environment: Shaping Education for the Future

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As the second millennium draws to a close, the new knowledge-based, fast-paced Information Age will present us with unprecedented challenges brought about by tremendous economic and social changes, the phenomenon of globalization and intense international competition. Despite the stresses and strains of changes and challenges, we must see this period as one rich in opportunities driven by the explosive growth of information, knowledge and technology. Young people of this generation must learn to capitalize on these opportunities in a world of rapid change. They will be expected not just to respond passively to change, but to participate actively to lead that change. Educational institutions must strive to prepare young people for this big challenge, by helping them acquire an inquiring, critical and creative mind, the ability and desire to continuously learn and seek new knowledge, and the necessary skills to cope with change. To state the obvious, in a world of rapid change, sound education is a first-class ticket for life. The onus is on institutions of learning to provide that ticket.

The need for a broad-based general education

The Information Age and the phenomenon of globalization have implications for various aspects of formal education. More important, perhaps, are the implications for the content of what is taught. For starters, students will no longer be well served by narrow, limited discipline-bound content. They will need global perspectives. As such, educational institutions must adopt systemic approaches to effect shifting paradigms in this direction. Formal education, especially higher education, is generally discipline-oriented with a high degree of specialization. While society does require a large number of specialists to perform specific tasks, it is questionable how much specialization is necessary or desirable at the secondary and undergraduate level. In the real world where problems are seldom, if ever discipline-bound, the problem-solver has to be both a generalist and a specialist. His thinking will have to cross discipline boundaries, constantly adapting to a changing world. Therefore, the curricula for different levels of formal education should emphasize interdisciplinary and multidisciplinary perspectives. This is a vital consideration in the design and development of materials for a multimedia learning environment. In addition, a broad-based general education must be provided to produce individuals who know something of everything and everything of something. The challenge of an education system, therefore, lies in striking a good balance between the breadth and depth of knowledge, be it at the school or university level. University education is by definition a specialized affair but, at the undergraduate level at least, it should not merely be about producing narrowly focused experts. The higher goal of university education should be more about well-rounded citizens who are able to contribute broadly to society, not just within their chosen specialized fields.
The emphasis on value-added education

The education of this and the next century must build a knowledge-based society where individuals are expected to be more creative, innovative and productive. The workplace of tomorrow will require employees with multiple skills, who are able to think creatively, to solve problems in novel situations. It will not be enough for educational institutions to provide individuals with knowledge, important though that knowledge is. There is no point cramming kids full of facts and not getting them to use and apply knowledge. Educational institutions must provide individuals with the skills to communicate, to venture, to lead. Individuals who succeed in the marketplace -- and in life -- are generally those with the ability and talent to solve problems creatively and effectively. Employees of the near future will not only have to become highly skilled, competent work force, they will need the resourcefulness and creativity to generate their own ideas and problem-solving strategies. Creativity, communications skills, thinking skills, basic computer literacy and information literacy must all become an integral part of the formal education system. This is what value-added education is all about. Education is not only about coming to know, it is also about learning to think.

Based on the issues raised in Paul Kennedy’s *Preparing for the Twenty-First Century* (1993), Privateer (1999) suggested that teaching has to become a "value-added-intelligence-producing" occupation if it is to survive as a knowledge-producing activity. This is particularly so if the conventional public university is not to lose its competitive edge to corporate universities. We see corporate universities mushrooming around us every time a Motorola, an IBM, or a Microsoft inaugurates a "learning campus" to support its research and development interests. For universities to compete and retain their tradition of being our culture's knowledge site, they must produce different and better kinds of learning outcomes. These will include the different aspects of education mentioned above, which can best be addressed by a conventional university with expertise in a wide range of disciplines. However, competition notwithstanding, we are also beginning to see strategic alliances emerging between universities and the private sector for the development of joint programs, as well as research and staff development. A recent example in Malaysia is the setting up of the JAVA Learning Center in Universiti Putra Malaysia (UPM), with a grant and support from Sun Microsystems Malaysia.

Of late, “virtual learning” has come into vogue. With new advances in the convergence of multimedia, information and communication technologies, more and more educational institutions are expected to jump on to the new bandwagon. A word of caution here: this much-vaunted "virtual learning" model currently practiced at all levels of formal education very often falls into the pitfall of launching the status quo into cyberspace, perpetuating what is referred to by Privateer (1999) as information-storage-based learning rather than intelligence-problem-solving-centered learning. Any institution, be it school or university, which can effectively deploy an IT-supported multimedia learning environment to promote the latter type of learning model will have an edge over the others in this increasingly competitive, borderless, international business or industry called education. What will keep educational institutions competitive and relevant is applying IT to teaching and learning in ways that nurture intelligence and creativity, and team-based collaborative and communication skills for
solving real-life inter- and multi-disciplinary problems. In short, the opportunities for real change in education lie in creating new types of teachers, new uses of IT and new kinds of multimedia learning environment which can provide value-added education.

**Redesigning instructional technology**

According to Bates (1997), current institutional policies for technology-mediated teaching and learning largely misunderstand the potential of IT. This is because the applications of IT in education, especially institutions of higher learning, are still based on the old models of teaching, mostly a case of reception-based learning migrating to a computer screen. Most of the times, students still read and memorize information. Video-conferencing and certain applications of the WWW still tend to be used primarily for information transmission in a didactic style, no difference from the classroom teaching model. Although computer mediated communication is used in some distance learning programs to promote a more collaborative learning model, it still resembles the discussion model of classroom instruction. The implication of this status quo is significant, especially to the future of higher education as online distance learning continues to grow in leaps and bounds. Education institutions are at a crossroads now, they must reengineer themselves to bring about meaningful change by redesigning instructional technology to give due emphasis to the use of IT as a cognitive tool. The educational technology agenda must focus on the production of intelligence and creativity rather than on the retrieval, storage and recall of quickly outdated information. We must find effective ways to capitalize fully upon the power of IT to revolutionize learning. We must use the multimedia learning environment to enable educational institutions to reinvent themselves as places, whether real or virtual, in which students become new kind of learners who are motivated by a strong desire to use their intelligence and creativity to solve problems. Today, no one blindly trusts the quality of an educational institution simply because of its history, but judges it more by the future it can hope to influence. In reinventing education, we must constantly bear in mind what today's learner will need to continue to learn and grow in the future in an increasingly globalized world of rapid knowledge life cycles.

**Teaching and learning in a multimedia environment**

To meet the needs for change described thus far, every educational institution should function as a knowledge laboratory that provides students the opportunity to test and apply knowledge in both real and simulated applications. The potential of a multimedia learning environment for enhancing this opportunity has been argued by new knowledge advocates of IT like the late Heinz Pagel, as well as others such as Ivan Sutherland, Frederick Brook and Seymour Papert. Whether in real or virtual learning environments, if our students were to be given this opportunity to enhance their intelligence and nurture their creativity, IT must be deployed in strategic ways. IT-supported learning in the multimedia environment must be exploratory and it must promote inquiry and discovery, with students constantly engaged in finding, organizing, analyzing and applying information in creative and novel ways to solve problems. They must be part of a global learning community where they collaborate to discover information from a variety of sources and ultimately applying that information not only to solve problems, but to communicate ideas and continuously build up their own knowledge base.
A multimedia learning environment can provide the range of tools for these purposes. Interactive multimedia CD-ROMs can be designed to generate para-realistic situations, complex simulations and expert systems for problem-solving exercises. An example would be a multimedia courseware that this author designed and developed (Gan, 1994, 1995). With the sponsorship of WWF Malaysia and Hewlett Packard Sales Malaysia, this courseware was distributed to all secondary schools and teacher training institutions in 1996. "What is your decision?" is a multimedia, interactive courseware which aims to teach subject matter (environmental education) and develop higher-order thinking skills (decision-making skills). It incorporates instructional methods and design features that encourage cooperative learning and discussion by adopting the general format of a situational simulation typified by role-playing and cycles of decision-consequence such as that used in Tom Snyder's Decisions, Decisions series. The major premise in the adoption of this format is that decision-making, which emphasizes on selecting from possible actions, can provide a suitable context for practicing four of de Bono's CoRT-1 thinking tasks: PMI (Plus-Minus-Interesting), AGO (Aims, Goals, and Objectives), CAF (Consider All the Factors) and C&S (Consequences and Sequels). Going through the simulation in a cooperative learning setting, each student has to constantly communicate with others in his group, evaluate the situation using the CoRT-1 thinking tasks, and make a group decision which often has dire and diverse consequences. Another example would be Times Learning System, which is said to be using "mind tools" to help kids in Singapore understand the concept of cause and effect (Ajello, 1999). In one lesson, kids interact with one another to figure out why certain species go extinct.

Another tool, the Internet can be used to facilitate access to the people, content, activities, guidance and opportunities to make learning a personal process. Learning will thus become truly inter- and multi-disciplinary as students build upon their prior knowledge, pursue interests, combine information in new ways to solve problems, and process information into a new understanding of knowledge to apply to novel problem-solving situations. In short, learning becomes a dynamic pursuit of new solutions rather than the acquisition of a package of facts prescribed by the teachers or the textbooks. Teachers must know how to create learning activities/experiences where students are guided and motivated to use the Internet to tap the vast reservoir of information and to communicate with others, while sitting in the classroom. Only the teachers' creativity and willingness to use "networks for learning" will limit the list of activities that may be designed for such learning purposes. In modern curriculum terms, the very understanding of curriculum as institutionalized text within the schools will change to include technology as part of that text and that discourse (O'Bannon & Brownell, 1999). In line with these principles, this author has experimented with using multimedia and the Internet to design learning activities to motivate at-risk students (Gan, 1999).

To effect IT-supported teaching and learning that is capable of shaping education for the future, there is a dire need for the professional development of teachers, to help them understand not just the technology, but its applications in teaching and learning. The most common form of training whereby teachers are shown how to use the technology is starting at the wrong place. Learning to access the Internet is a relatively simple task, but mastering its use as an effective tool to improve teaching and learning by integrating it into one's teaching style is certainly not. Teachers must be well versed
in cognition and learning theories to fully understand how learning occurs to create their own eclectic techniques from a wide range of instructional approaches and media. They need a firm theoretical foundation in education so that innovative instructional approaches plus access to IT such as the Internet will lead to the creation of multimedia learning environments that are flexible and provide value-added education, regardless of time and distance constraints.

The role of private sector

In recent years, the private sector or business is said to be slowly, but surely, encroaching into the education market. In Malaysia, private sector is setting up more and more private schools. In the United States, according to Buchen (1999), the Edison Project and the charter schools are challenging public schools. In addition, all kinds of educational services and products are being marketed these days, many increasingly bear the stamp of technology. People are beginning to perceive such services and products as replacing teachers altogether or reducing their number, thus solving several critical weaknesses in traditional educational institutions. Is the involvement of business in education posing a threat to the established school system? This author thinks not, if public educational institutions and teachers know how to capitalize on available quality educational products and services. In the schools of the future, a progressive teacher will become less of a teacher -- who teaches in the didactic manner of imparting knowledge -- but more of a learning manager, organizer or coordinator who designs, plans and monitors learning activities. These learning activities will make optimal use of the gamut of quality educational products and services available to stimulate and develop young minds. These products will include hardware, software, courseware, the Internet and other instructional technologies. The services may include online lessons, diagnosis and testing services. In other words, a typical school in the future will be a truly multimedia learning environment, much like a huge depository of educational resources managed by teachers. Teaching in the future will incorporate a wide range of products and services provided by specialized businesses.

At the tertiary education level, the encroachment of business into education is manifested in the offering of virtual and online programs, though many of them are joint ventures or alliances between universities and businesses, including publishers. Whether for online or on campus instruction, by and large, universities have taken various measures to ensure that its faculty will be able to use IT-supported teaching and learning to effectively shape education for the future. In Malaysia, the most recent example of such efforts is the setting up of JAVA Learning Center on Universiti Putra Malaysia campus. One of the objectives of this center is to provide training for academic staff to use JAVA language in the development of multimedia and interactive instructional materials. It is hoped that the applications of these instructional materials in the multimedia learning environment will help to shape education on campus and online, to meet the educational needs and demands of current and future generations.

Conclusions

Shaping education in the new Information Age to meet the needs and demands of learners and the society at large is a daunting task. Where information technology is
concerned, our interest should not be only in the quantity or sophistication of high-tech tools available in the multimedia learning environment, but the quality of learning outcomes that results from their use. The most pressing IT-related challenge is ensuring that the tools we have invested so much in are wisely and optimally used. The opportunities for educational institutions -- through the multimedia learning environment, their teachers, administrators and students -- to evolve into new, different and better types of institutions for the next millennium have never been greater than now. The choice for us is change now, or face obsolescence in the near future!

References


