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## Synopsis

### *Education*

As health care professionals and educators we have historically used our experience-based skill and knowledge to select and structure material for delivery to our health care clients and students. We distilled, pasteurized and packaged our material to precisely meet the objectives of the information delivery and consumption processes. That has, however, changed dramatically. The increasing rate of growth and change of the global knowledge base in health care has made it increasingly difficult for us as health care professionals educators to systematically incorporate new and changing information into the curricula we deliver to our students and the advice we provide to consumers.

Fortunately, the growth of the Internet into a public avenue for electronic communication and the development of tools to facilitate that communication have provided a new set of tools with which to manage that growing tide of rapidly changing information. However, like all tools, they can be wielded destructively, whether by intent or accident, or they can be used productively with appropriate training and experience. The five papers on education included in this yearbook deal with the use of electronic communications both as a means of educating health care professionals and informing patients. Thankfully, all of the authors, while recognizing the potential value of the electronic medium for this purpose, are also quick to advise to use

caution in its application.

Of the five papers reviewed for this synopsis two deal with ways of assessing the medium in terms of the way information is delivered to the consumer [1, 2], two deal with the consequences of delivering information using this medium [3, 4] and one with how this medium conforms to current pedagogical approaches [5]. Given the wealth of communication opportunities that electronic media provide, the diversity of this collection highlights the notion that we, as the source of health care information, must examine the impact of the mechanism of delivery in its many dimensions.

It is gratifying to see that the authors of the two papers on assessment tools [1,2] point to the inherent limitations of the tools and the care that must be used interpreting the results of evaluations done using those tools. These groups developed systematic tools to assess the suitability of a variety of web sites for use in health care curricula. While both acknowledged the importance of developing systematic methods for assessing the pedagogical value of these sites, they both identified that a systematic approach could not do justice to some of the more creative aspects of curriculum development. Further, as we change our patterns of teaching and learning to exploit the potential of the electronic medium we must change the instruments we use to measure our effectiveness.

By nature, the electronic medium

provides a dynamic environment from which to deliver information. Therefore, it is as important to assess the delivery process as it is to assess the content being delivered. While the two groups dealt with both of these dimensions Berry et al. [1] placed some emphasis on content while Premkumar et al. [2] stressed the process. This is not intended as a criticism, rather the contrary: that both approaches are valid and equally important. One aspect that Berry et al. [1] dealt with well in their evaluation approach was the question of accessibility. We, who define the content and shape the information to be delivered, frequently forget that the intended consumers of our labour may not be as technologically well endowed. The most elegantly prepared material will not even have a chance to have its intended effect if the target audience cannot access it. Just as we have to craft our classroom material to a common intellectual denominator we must craft our electronic material to a common technological denominator.

A minor but disturbing aspect of the paper by Premkumar et al. [2] was that they appear to use the terms "multimedia" and "electronic" interchangeably. It is important to distinguish between the use of electronic techniques for the communication of information and the presentation of that information in a variety of formats. While the use of electronic means of communication provide us with a ready means of delivering information in a variety of

formats, it is the facility to structure information in a virtually infinite variety of ways (hyperlinked information nets) that is the true value of the electronic medium for education.

The two papers dealing with the use of electronic media to inform patients are clearly in the realm of health promotion as defined by the Ottawa Charter<sup>1</sup>. The Ottawa Charter on Health Promotion, a product of the First International Conference on Health Promotion, held at Ottawa, Canada, in November 1986, focused the concept of health promotion on "... enabling people to increase control over, and to improve, their health." This clearly is the purpose of the systems described in these two papers. Interestingly the two systems described deal with slightly different but complementary aspects of informing patients. McRoy et al. [3] describe an adaptive conversational system that supports the process of providing information about themselves while that described by Tang et al. [4] is intended to provide information to the patient about the results of an encounter.

It is too early to conclude that systems of this type have a clearly positive influence in terms of health promotion. However, both papers report a high degree of acceptance of the systems by patients who, as a population, increasingly want to understand their health and diseases and participate in their health care processes. Tang et al. [4] provide some anecdotal evidence that the information provided through the system "favourably affected their participants' trust in, relationship with, and confidence in their physicians" and that "they were more motivated to adhere to a treatment plan". Both groups were clearly interested in assessing the process of delivering information to patients by electronic means and have provided us with the incentive to continue crafting

educational materials for electronic delivery.

It must be remembered that informing patients by this means is not intended to replace the personal provider-patient relationship. Rather it is intended to enhance it by providing a means of delivering comprehensive and consistent information to the patient allowing them to be more active partners in that relationship.

The fifth paper in this series directly addresses the use of electronic media as an adjunct to an emerging educational paradigm. Virtually all academic teaching is in the process of migrating from content focused instruction to process focussed instruction. The progressive move toward the "problem-based learning" or "case-based reasoning" approach in medical education is an example of this change. Given the nature of this change, it is probably not unreasonable to expect our students to shoulder some of the burden of critically evaluating and consuming the information required for their education. This serves the dual purpose of redistributing the information processing load and honing the analytical skills of the information consumers ... our students.

An inherent limitation of paper-based educational materials is that they cannot "interact" with the user, providing feedback that is essential to the incremental learning process that is the essence of the "case-based reasoning" approach. The burden, then, falls on the faculty to provide the feedback the problem solving process requires. Carlile et. al. [5] report on a system that effectively merges the functions of providing content and feedback in a staged manner during the reasoning process. The system, implemented using web client server technology and an institutional intranet, allows students to progress through the curriculum in an autonomous, self-paced manner. The system described in this paper is an example of an appli-

cation that could not exist without using electronic communication. It capitalizes on the facility, inherent to the medium, to structure material in a temporal dimension that allows the action reaction cycle to occur.

The reactions to the system by students and staff have been mixed. The authors attribute this to the users having to work through the learning curve and are confident that once users are more familiar with the technology, the system will become more uniformly acceptable as an adjunct to traditional classroom teaching.

In conclusion, the future of the use of electronic media in education appears rich with opportunities but to exploit those opportunities we must be prepared to adapt the way we teach and learn to exploit the potential. The future of this medium is not, however, without its dangers and we must continue to evaluate its use appropriately if we are to remain masters of the technology and not its servants or victims.

1. Berry E, Parker-Jones C, Jones RG, Harkin PJR, Horsfall HO, Nicholls JA, Cook NJA. Systematic assessment of World Wide Web materials for medical education: online, cooperative peer review. *J Am Med Inform Assoc* 1998;5:382-89.
2. Premkumar K, Hunter W, Davison J, Jennett P. Development and validation of an evaluation tool for multimedia resources in health education. *Int J Med Inform* 1998;50:243-50.
3. McRoy SW, Liu-Perez A, Ali SS. Interactive computerized health care education. *J Am Med Inform Assoc* 1998;5:347-56.
4. Tang PC, Newcomb C. Informing patients: A guide for providing patient health information. *J Am Med Inform Assoc* 1998;5:563-70.
5. Carlile S, Barnet S, Sefton A, Uther J. Medical problem based learning supported by intranet technology: a natural student centred approach. *Int J Med Inform* 1998;50:225-33.

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<sup>1</sup> <http://www.who.dk/policy/ottawa.htm>