Medical Education for the Next Millennium: The Medium and the Message

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We look forward to the next millennium as a time of both challenge and opportunity and confidently expect that new medical roles requiring new competencies will continue to emerge. Some of those roles have been defined by the CanMEDS 2000 project, and the competencies they require depend heavily on interpersonal communication and leadership skills. In preparation for new medical roles, the style of medical learning may be as important as what is studied. Marshall McLuhan coined the aphorism, "the medium is the message', to describe modern mass communications. He may, unwittingly, also have provided us with the key to understanding what is required in medical education. The medium, or style of learning, is the main feature that distinguishes modern medical education from traditional approaches. This paper examines the concepts of medium and message and argues that problem based and experiential learning may be better media to develop the skills and competencies required for physicians of the next millennium.

Bahrain Med Bull 1998;20(1):25-27.

Marshall McLuhan (1911-1980) coined the popular aphorism "the medium is the message[1]". He was called a cult figure and "the guru of the electronic age" but was also the chief theorist for mass communications in this century. His ideas are still relevant[2] and his insights may help us to communicate more effectively to achieve the goals of modern medical education.

As the current millennium draws to a close we have become obsessed with change. We see it everywhere: in medical technology, economic and the shifting needs and expectations of society. Medical education is being redefined as preparation for a "lifetime of change[3]", but how is this to be accomplished ? As a first step, educators must anticipate the new roles and the competencies for adaptation that will be required of future physicians.

This was the task set for the CanMEDS 2000 project, to "ensure that postgraduate specialty training programmes are responsive to societal needs". Their report, "Skills for the New Millennium" (1996)[4], delineates a competency framework that will help future specialists respond to challenges as health-care providers - challenges of adapting to a health-care system in a state of flux. The Canadian College is not alone. In Britain the General Medical Council (GMC) has recommended sweeping changes in the undergraduate curriculum, to prepare students who adapt better to change and who acquire attitudes which ensure continued updating[5]. "An agenda for action[6]" to change medical education has also been published by the WHO.

This paper discusses the educational medium and message in developing competencies for change. I will hypothesize that, for many of the emerging roles, the style of learning (the medium) is as important as what is studied (the message). In preparation for some roles the medium is the message.

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Specialist Education

The CanMEDS 2000 report describes seven "roles" for specialists of the future, each defined by a "cluster of competencies" and a number of "specific objectives". These roles are medical expert and clinical decision-maker, scholar, communicator, collaborator, health advocate, manager and professional. In our professional lives we each play some of these roles; few master all seven. The list is not novel, what is new is the scope of the recommendations and the emphasis on common competencies across specialties. This theme was reinforced by a recent message from the President of the College advocating a balance between differentiation and integration[7]. If differentiation is synonymous with specialization, integration must emphasize the importance of generic skills and shared training experiences. More of these training experiences should be directed towards developing the interpersonal and communication competencies required of a communicator collaborator, manager and health advocate.

Undergraduate Education

The roles described above are specialists' roles and will serve as a useful guide for postgraduate eduction, but they are not the roles that will immediately burden a new medical graduate. Traditionally medical schools have defined their mission as the education of generalist or undifferentiated physicians. In reality the generalist physician no longer exists. Medical graduation is a step in the educational process, the gateway to specialist education. The medical graduate's next role will be as a junior resident in a speciality or family medicine programme. It would be more apt to consider undergraduate medical education as preparation for the next stage of learning, and the end product an undifferentiated resident, not a generalist physician. If the real goal of medical education is preparation for junior residency, not general practice, much of what is taught in medical school is redundant. This is present day reality, not millennial fantasy and a modern curriculum should start by redefining the expected roles of a medical graduate. My personal, minimal list would contain three distinct roles.

The new medical graduate should be prepared to function effectively as:

1. a generic junior resident
2. a self directed learner
3. a working member of a health care team

Each of these roles can be defined by a cluster of competencies and a set of specific learning objectives. Undergraduate medical education should provide a variety of learning experiences that develop those specific learning objectives.

In this discussion an effective learning experience will be defined by both its medium and message. The metaphor for medium is the teaching/learning style. A traditional example is the lecture, a modern example is problem-based learning. The metaphor for message is a packet of educational cues. Traditionally these are known as medical "facts" but effective cues (messages) may have many verbal and non-verbal forms. Message and medium are applied to shape a specific learning objective, such as new knowledge, a technic skill or a behaviour.

Learning Experiences: Message and Medium

Message and medium have different expressions in the traditional and millennial approaches to medical education.

The Message

In the millennial model message is definitely not 'core curriculum'. A core curriculum is an archive, what was important at one point in time, not a stimulus to adaptive learning. Adaptive medical learning is essentially utilitarian, "A little knowledge that acts is worth infinitely more than much knowledge that is idle"[8]. The CanMEDS 2000 report recognises that medical expert and clinical decision-maker are essentially one role, knowledge and its application are inseparable. It follows that effective medical learning occurs in the context of a specific need to solve a problem. learning for any other purpose is a luxury, usually casually tossed off as a hobby, as in studying the history of medicine.

Current medical knowledge is also dynamic; as new information is integrated into clinical practice some of the old becomes redundant or displaced. In order to keep abreast we must learn to discriminate, as Sherlock Holmes advised Dr Watson, "depend upon it there comes a time when for every addition of knowledge you forget something that you knew before. It is of the highest importance, therefore, not to have useless facts elbowing out the useful ones"[9].

Useful information is that which is both current and valid, and we discriminate by the scientific paradigm of verifiable evidence. "If they don't depend on true evidence, scientists are no better than gossips"[10]. The application of rules of evidence to medical decision making is evidence-based medicine[11]. Although the concept is fundamental to scientific medicine, practical guidelines for applying evidence based-medicine to teaching and clinical practice are relatively recent.

The Medium

The traditional preclinical curriculum is taught by conventional channels of communication: lectures, demonstrations and systems based study. Problem-based learning (PBL) was introduced to correct perceived deficiencies in these methods, to stimulate self directed learning and to provide a structured introduction to clinical reasoning[12]. PBL has been adopted by many schools in its pursuit or variant forms, but it is by no means universal.

Experience-based learning (EBL), usually called simply experiential learning, plays a similar role in clinical education. In EBL "primary importance is assigned to the resident's clinical experiences"[13]. This is not a new concept but EBL has acquired utility because it provides a practical means to link clinical education to the current medical needs of the community. An EBL based curriculum has been advocated for internal medicine[14,15] and anaesthesia[16], but it is not just a tool for specialty training. The principles of EBL apply to all clinical education including the undergraduate clinical - clerkship.

The experience-based learning and problem-based learning models have important similarities and each is appropriate at a different stage in undergraduate medical education. They share a common starting point, the clinical problem. Both rely on the group learning process: the tutorial group in the preclinical years, the clinical teaching team during clinical training. In both a body of medical information (or evidence) is organised in a portfolio. And, both owe their conceptual basis to Kolb's learning theory, though the concept of hands-on learning certainly predates Kolb[17]. Mao Zedong was probably quoting early Chinese philosophy when she said in 1937, "If you want to know the taste of a pear, you must change the pear by eating it yourself ..... if you want to know the theory and methods of revolution, you must take part in revolution. All genuine knowledge originates in direct experience"[18].

The Medium is the Message !

What distinguishes the traditional and millennial approaches to medical education ? In the traditional approach the medium is a tool for teaching and the message is a collection of medical facts, a core curriculum. The memory bank of facts is applied to "solve" problems. In millennial education the problem is the stimulus for new learning and the process of gathering facts is selective. Problem oriented learning also has two working levels, group and individual. The group level fosters teamwork and leadership skills; the individual level emphasizes self directed learning competencies. These are the skills and competencies required of a new medical graduate, ie. a successful resident, and are largely independent of the intended message. In this view of medical education the what and how of learning are integrated. When the learning objectives are generic interactive and communication skills, the medium is the message.

Although this review is clearly biased towards PBL it should not be automatically concluded that all other styles of learning are ineffective. In the context of educating for change, however, PBL may offer greater flexibility.

CONCLUSIONS

For most of this century content, core curriculum, has dominated the curriculum agenda. Interest in the medium by which learning occurs is a recent phenomenon. Proponents of PBL believe that it teaches students to be more versatile and adaptable and therefore better prepared to meet the challenges of medical change. Obviously the professional roles of physicians are expanding, their adaptability and versatility are being stretched, and these trends will probably continue. Whether learning style is a cause or effect of these changing roles is speculative. Though the hypothesis that the medium for learning develops desired competencies has some face validity, it will be difficult to test. However current expert thinking links the two and we will probably see a further shift away from traditional methods of medical education. Perhaps the best thing to be said for millennial education is that it will be more fun for both students and teachers.

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