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COMMENTARY

Outcome-Based Education: the future is today

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Medical education, perhaps more than at any other time, faces pressures for change in response to the rapid developments in medical and health care delivery, advances in information technology, globalisation influencing medicine and education, changing political and public expectations, demands from within the profession and developments in how we look at teaching and learning. The greatest catalyst for change, it has been argued, is a language that will allow us to discuss what we are expecting students to learn and how we should assess this (Jessup 1995). This themed issue of Medical Teacher illustrates how learning outcomes can provide this necessary language. Jessup's essential thesis in relation to outcome-based education (OBE) is "if education or training is defined by outcomes, it opens access to learning and assessment in ways which are not possible in traditional syllabus or programme based systems. Once learning is targeted on outcomes, the other features of the model follow as a natural consequence. Many of the problems we face in education and training could be solved by this model." (Jessup 1991).

Traditionally courses in medicine as in other disciplines were defined in terms of their duration – a four year course, a week module or rotation – and in terms of their syllabus with specification of content and the teaching provided in the form of lectures, practical classes etc. Clear statements as to what students were expected to learn was not on the agenda. It was almost as if we expected students to join us in some sort of magical mystery tour with an assessment at the end. As Rowntree (1982) noted: "to set the student off in pursuit of an unnamed quarry may be merely wasteful, but to punish him for failing to catch it is positively mischievous. Do we sometimes appear to say to the student: 'I can't say precisely what skills or knowledge I want you to acquire from this course. Just do your own thing (guessing what might come into my mind) and I'll give you a grade according to how I feel about it'"? This has all changed however, with the move to an OBE model. In medicine the process of exploring learning outcomes has been illuminating and has uncovered what in the past has remained mainly hidden. It has made us question the validity of much of what we teach and how we teach it. Course descriptions, for the most part, have made no reference to decision making, self assessment and other personal skills – all essential attributes for a doctor. In OBE it is specified what students are expected to learn and the course of study is arranged so that they achieve this. It is a message difficult to disagree with.

This themed issue of Medical Teacher recognizes that a significant change has taken place in medical education with the move from an emphasis on process, where what matters are the teaching and learning methods, to a product model where the emphasis switches to the learning outcomes of the education experience. As noted by Spady (1994) it is a move from a situation where WHEN and HOW students learn took precedence over WHAT is learned and WHETHER it is learned well. "Medical educators" suggest Frank & Danoff (2007) "begin with the end in mind and focus on the competencies needed by graduates of medical education to meet the needs of those they serve, and effect the outcomes desired in health care."

Tyler's (1949) pioneering work on the objective model for curriculum planning has had a major influence on higher education and can be interpreted as a forerunner of the OBE movement (Burke 1995). His work was taken up by leading educationalists and, following the publication of a taxonomy by Bloom (1956), the concept of instructional objectives has influenced the specification of learning programmes. A feature of instructional objectives was that they were specified in great detail. The list of curricular objectives produced by the Southern Illinois University School of Medicine in 1976 for example took 808 pages. The complexity and logistics of dealing with such a large number of learning objectives, however, proved just too difficult for teachers and students to manage. A perceived weakness of statements and objectives was that they represented detailed but superficial and atomized descriptions of what should be learned. In general, statements of learning outcomes are more sophisticated and avoid this problem. They represent an overview of what is expected of a doctor and the professional competences required. Burke (1995) distinguished outcomes and objectives and noted that an objective is characterized as essentially an intention, while a learning outcome is the projected realization of that intention. This distinction between learning outcomes and instructional objectives was discussed further by Harden (2002a).

Significant progress has been made in OBE since the subject was last reviewed in an editorial in 2002 (Harden 2002b). This issue of Medical Teacher highlights the many developments that have taken place since then. The sixteen articles provide a rich source of information and a snapshot of where we are today with the development and implementation of an outcome based approach in medical education. The first seven articles describe important systematic frameworks for presenting outcomes and their cross-referencing. The agreement by the five medical schools in Scotland of

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a framework and a set of learning outcomes has been described (Simpson et al. 2002). A third edition of the "Scottish Doctor" learning outcomes will be published shortly by AMEE. This edition reflects a cross-referencing exercise with the UK General Medical Council's learning outcomes as set out in "Tomorrow's Doctors" (General Medical Council 2002). The cross-referencing between two sets of learning outcomes is described by Ellaway et al. (2007). Cross-referencing is an invaluable mechanism for analysing learning outcome models and for identifying omissions, differences in emphasis or contradictions. Cross-referencing learning outcome frameworks, Ellaway et al. argue, needs to be undertaken with care, with a critical awareness of the tolerance of the results, and by a sufficiently expert and representative group to provide it with the authority and validity it requires.

The comparison of degrees across Europe using an outcome-based approach is the subject of the second article (Cumming & Ross 2007). Comparison methods based on the duration of study are intrinsically flawed and give little guide as to what can be expected of graduates in a workplace setting. For this reason, the European Commission supported and funded a sector-wide project to agree learning outcomes/competences for all disciplines in Higher Education in Europe. This is known as the Tuning Project. Learning outcomes for medicine were specified following a set of procedures that included the review of existing outcomes frameworks, the development of a new draft framework, a series of workshops reviewing the draft, a web-based survey to obtain as wide a range of opinion as possible in schools throughout Europe, ratification of the findings by the MEDINE network and validation of the results by an expert panel. Cumming and Ross argue that the Tuning Project is not an attempt to impose rigid uniformity – indeed one great advantage of the outcomes approach is that diversity in educational process and curriculum design can be preserved. Importantly Cumming and Ross make the point that existing outcome frameworks need not be abandoned, but simply cross-referenced against the European document. A core curriculum for European medical students with 76 learning outcomes structured in nine domains – Clinical Skills; Communication; Critical Thinking; Health in Society; Life Long Learning; Professionalism – Attitudes, Responsibilities and Self Development; Teaching; Teamwork; and Theoretical Knowledge – has been produced by the European Medical Students' Association (EMSA) and the International Federation of Medical Students' Associations (IFMSA) (IFMSA and EMSA 2007).

While the first two papers have their focus on undergraduate medical education, the third paper is based on the work of the Royal College of Physicians and Surgeons of Canada and is set in the context of postgraduate and continuing education. In the two decades since its inception, the CanMEDS framework has become well recognized, not only in Canada but around the world, and its use has been extended to undergraduate medical education. The CanMEDS framework of medical expert, communicator, collaborator, manager, health advocate, scholar and professional has been widely adopted (Frank & Danoff 2007). The Accreditation Council for Graduate Medical Education in the US has also been active in postgraduate education through its "Outcome Project". Changes in residency programmes in the US have resulted that focus education on the competency domains, enhance assessment of resident performance and increase utilization of educational outcomes for improving residents' education. Increased emphasis on educational outcome measures in accreditation has been another important ACGME goal. The six ACGME general competency domains are patient care, medical knowledge, practice-based learning and improvement, inter-personal and communication skills, professionalism and systems-based practice. Swing (2007) recognizes that one of the reasons that the outcome project has influenced medical education in the US is that it provides a common language and a framework for thinking about medical education.

A content taxonomy for undergraduate medical education has been developed by Willett et al. (2007) at the University of Ottawa. This aims to make explicit the relationships of content to outcomes. They describe the relationship between the University of Ottawa's outcomes which are based on the CanMEDS competencies and the 'Scottish Doctor' outcomes. Willett and co-workers remind us of the vision for outcome-based as expressed by William Spady – "Outcome-based education is not a program, a package, a technique, a fad, a quick-fix, a panacea, a miracle or an event. It is a transformational way of doing business in education".

The final paper in this first section provides an additional perspective of learning outcomes (Quinn et al. 2007). They argue that medical educators are being challenged now more than ever to modify both the structure and content of medical education. What is needed are clinicians who will be: reflective about how they practice medicine; passionate about keeping patients safe; collaborative in using every member of the healthcare team effectively and efficiently; and willing to make changes when presented with evidence that contradicts what they may have learned or done for many years. They go on to express concern that "the sad truth is that tomorrow's physicians often train in inefficient, ineffective and, too often, in unsafe systems." They argue that as educators we must do more to prepare future clinicians for challenging or reforming the current culture of health care. To meet the need for preparing residents for the challenge of improving the care of patients, two quality improvement specialists at Vanderbilt University developed an educational tool, the Patient Healthcare Matrix. The Matrix juxtaposes the six Institute of Medicine (IOM) aims for improvement and the six ACGME core competencies and guides the evaluation of patient care as seen by medical students, residents, and practicing physicians. Quinn et al. (2007) provide an example of the use of the grid in the care of a patient with chest pain.

A rich variety of frameworks for expressing and communicating learning outcomes has been described in the papers in this issue. When choosing a framework, questions to be asked should include:

- do the outcomes as represented describe the competencies expected of a doctor and reflect the appropriate sense of values?

- Does the framework provide a holistic and integrated view of medical practice?
- Is the framework intuitive and easy to use?

Almost certainly there will be no agreement on a uniform or standard framework. What matters, as noted by Ellaway et al. (2007), Cumming & Ross (2007) and Willett et al. (2007), is that it is possible to translate outcomes between the different frameworks.

The second group of papers addresses some important issues in relation to outcome-based education. Christensen et al. (2007) look at the process/outcome relationship and its implications for standard setting in medical education. They argue correctly that there has to be a close relationship between process and outcome. This relationship is the key thrust of the article on the implementation of outcome-based education by Harden (2007a). No-one advocates that learning outcomes should be pursued at the expense of all other aspects of the education process, which is the concern of Christensen and co-workers. They suggest that "learning outcomes have always been an integrated part of medical education strategy" and that the formulation of clearly defined and published learning outcomes have been included in every type of curricula planning to date". This almost certainly is an overoptimistic view. The fact that we may not have instruments to assess all of the expected learning outcomes, another concern of Christensen and co-workers, does not mean that we should move away from an emphasis on learning outcomes. The opposite is the case. A clear statement of learning outcomes is an incentive to explore and improve on the available assessment tools. Christensen et al. look at a comparison between the WFME standards and the International Institute of Medical Education and GMER standards. The analysis is of interest but many will disagree with their conclusions. Christensen and co-workers rightly remind us, however, that outcome-based education is not a magic bullet and that problems may arise if an outcome-based approach is improperly used. Learning outcome frameworks such as those described in this themed issue, embracing outcomes such as creativity, decision-making and personal development, if appropriately implemented, will help medical education to respond to future challenges.

Like Christensen and co-workers, Harden (2007a) is critical of the learning outcomes movement but only if it stops short at the preparation and publication of statements and formulations of learning outcomes. This is not what outcome-based education is about. "Outcome-based education", suggested Spady (1994), a pioneer in the field, "means clearly focusing and organizing everything in an educational system around what is essential for all students to be able to do successfully at the end of their learning experiences. This means starting with a clear picture of what is important for students to be able to do, then organising curriculum, instruction, and assessment to make sure this learning ultimately happens." OBE requires, in addition to identifying, making explicit and communicating learning outcomes to all concerned, that decisions about the curriculum including the teaching methods and learning strategies, the assessment procedures and the learning environment are based on the agreed learning outcomes. Harden describes an OBE implementation profile designed to assess the level of adoption of OBE in an institution.

In the formulation of learning outcomes, attention is frequently paid to the exit learning outcomes. As pointed out by Harden (2007b), an OBE model also has an important role to play in the monitoring of a student's progress through the different phases of the curriculum and in the planning for a more seamless continuum between undergraduate education, postgraduate education and specialist training. A model is described for examining this progression from novice to expert in terms of learning outcomes. The four dimensions include an increase in breadth covering new aspects of a learning outcome, an increase in depth or level of difficulty associated with greater complexity; an increase in utility with greater application to medical practice and an increase in proficiency where there is greater efficiency in performance and less need for supervision.

The final group of papers describes the implementation of an OBE approach in a range of different contexts. Hoat et al. (2007) report how the eight medical schools in Vietnam worked together, involving more than a thousand teachers and other experts in the process, to develop detailed learning objectives. The result was a book listing the expected outcomes in the form of knowledge, attitudes and skills expected of a medical doctor graduating from any medical school in Vietnam. Most importantly the process of identifying the outcomes was followed by a corresponding revision and introduction of a new curriculum including a more community-orientated approach. This case study presents an interesting example of a bottom-up approach to curriculum development that takes account of new approaches to teaching and learning in medicine and newly emerging health issues. Elizondo-Montemayor et al. (2007) describe how 120 faculty members and deans of medical schools in Mexico worked collaboratively to identify, by consensus, national outcomes and minimum essential requirements for Mexican medical graduates. The nine outcomes defined related to (1) clinical skills; (2) communication skills; (3) public health and health systems; (4) scientific bases of medicine; (5) information management; (6) critical thinking and research; (7) teaching skills; (8) administrative and legal aspects of medical practice; and (9) values, attitudes, professionalism and ethics.

Work on the specification of the global minimum essential requirements (GMER) for a doctor has been reported previously in Medical Teacher (Schwarz & Wojtczak 2002). In a paper in this issue Schwarz et al. (2007) illustrate the application of the standards in China with the results from the performance of a single student who went through a comprehensive assessment process, the performance of all students at one of the eight medical schools and the collective performance of all students at all eight medical schools. The implementation of the GMER and the assessment procedure to match them allowed conclusions to be drawn as to where a student, a school and all the schools had strengths, where they were borderline in performance or where they needed improvement. The results may serve as a blueprint for medical education reform in China. Xiao et al. (2007) give a more personal account of their experience in

implementing the GMER evaluation at the medical school of Sun Yat-sen University. They compare the situation with the effect of the Flexner report in the USA which resulted in a remarkable improvement in the quality of education and patient care across the North American continent. They argue that it is possible the IIME-GMER effort could have the same effect in China and around the globe.

The relationship between learning outcomes and assessment was explored in an AMEE guide by Shumway & Harden (2003). In this issue, Smith et al. (2007) discuss the approach taken to assess students in an outcome-based curriculum at the beginner, intermediate and advanced levels. One result of the adoption of an outcome-based approach to medical education is that educators are facing the challenge of assessing medical students in competencies that have not traditionally been a focus for teaching and learning. These non traditional competencies, suggest Smith and colleagues, include professionalism, life-long learning, self-awareness and personal growth and moral reasoning and clinical ethics. The article by Smith and colleagues focuses on how one institution, Brown Medical School, approached at the three levels of medical student proficiency the problem in relation to the social and community contexts of health care.

The final paper by Davis et al. (2007) describes a series of case studies in OBE presented at the 4th Asia Pacific Medical Education Conference in Singapore in February 2007. Four schools in disparate parts of the world – Scotland, USA, Pakistan and Singapore – presented a case study of their curriculum. Each school is at a different stage of implementation of OBE. The case studies provide medical educators with an international perspective of the direction of medical education reform, examples of different levels of conversion to OBE and of the change process required to move towards the implementation of OBE. The case studies highlight the need for consultation, staff development, staff buy-in and willingness to act on feedback if OBE is to be adopted. Davis and co-authors conclude that leadership, medical education expertise, tenacity and persistence are essential if an OBE approach is to be introduced and is to succeed.

The papers in this issue are an indication that, more than at any other time, teachers in medicine are now concerned and closely involved with curriculum development, including what should be taught, how they should teach it, how they will know if it has been learned and how the process should be managed. OBE is a unifying concept that holds together everything that medical education is about. Boschee & Baron (1993) in their text on OBE, argue that "...like health-care professionals, educators cannot continue to use their equivalent of the Model-T Ford. They require the delivery capacity of the supersonic jet, a post-industrial information-age model, if they are to educate youth for the workplace and for social cohesion in the twenty-first century". They suggest that "Outcome-based education can be this supersonic jet model". This may also apply to medical education. Much has been done since the concept of outcome-based education was first introduced in the journal in 1999, when Harden et al. (1999a,b) described a framework for presenting outcomes that encouraged a holistic and integrated approach to medical education. This issue of Medical Teacher recognises the huge strides made in medicine in the move to an OBE model. It also identifies the problems associated and the need for further development and research if the OBE movement is to achieve its full potential. However, the work to date on OBE provides a good basis for the training of the doctors for tomorrow – the future is today.

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