Outcome-based education – the ostrich, the peacock and the beaver

RONALD M. HARDEN

International Virtual Medical School (IVIMEDS), Dundee, UK

Abstract

Significant progress has been made with the move to outcome-based education (OBE) in medicine and learning outcomes are on today's agenda. Learning outcomes have been specified in a number of areas and frameworks or models for communicating and presenting learning outcomes have been described. OBE has, however, two requirements. The first is to make the learning outcomes explicit and the second is the use of the specified outcomes as a basis for decisions about the curriculum. It is the second requirement that is often ignored.

Three patterns of behaviour have been identified – the 'ostriches' who ignore the move to OBE believing it to be a passing fad or irrelevance, the 'peacocks' who display, sometimes ostentatiously, a specified set of outcomes but stop there and the 'beavers' who, having prepared their set of learning outcomes, use this as a basis for curriculum related decisions.

An OBE implementation inventory is described that allows schools to assess their level of adoption of an OBE approach in their institution. Schools can use this to rate their level of OBE adoption on a five point scale on nine dimensions – a statement of learning outcomes, communication with staff/students about the outcomes, the educational strategies adopted, the learning opportunities available, the course content, student progression through the course, assessment of students, the educational environment and student selection. A profile for OBE implementation can be prepared for the institution.

The move to outcome-based education (OBE)

Outcome-based education (OBE) is very much on today's agenda with learning outcomes in medicine the subject for discussion and debate (Harden 2007a). Medical Schools, educational bodies and specialist organizations have worked energetically on the preparation of sets of learning outcomes that cover undergraduate and postgraduate medical education and specialist areas ranging from genetics to accident and emergency medicine. This discussion of learning outcomes has encouraged a legitimate debate on what kind of attributes or competencies we expect in a doctor and how these will be assessed. In the UK, the General Medical Council has published their vision of medical education in 'Tomorrow's Doctors' (General Medical Council 2002) incorporating an outcome-based approach. Rubin and Franchi-Christopher (2002) reported that "In line with current educational theory and research we have adopted an outcomes-based model. This sets out what is to be achieved and assessed at the end of the medical course."

OBE is a sophisticated strategy for curriculum planning that offers a number of advantages (Harden et al. 1999). It is an intuitive approach that engages the range of stakeholders including those who have not made a study of education. In line with current education thinking, it encourages a student-centred approach and at the same time supports the trend to greater accountability and quality assurance. Not least, an outcome-based approach highlights areas in the curriculum

Practice points

- Outcome-based education (OBE) requires, in addition to the specification of learning outcomes, a close match between the outcomes and the curriculum content, the teaching methods and learning strategies, the assessment and the educational environment.
- The OBE implementation inventory provides a tool to help teachers, schools and educational bodies to assess the extent to which OBE has been implemented in their institution.
- The OBE inventory allows a teacher, a school or an institution to create a profile of their approach to OBE.

which may be neglected whether they are traditional aspects of medical practice such as ethics and attitudes or newer views on basic or clinical sciences including genetics.

The problem

What then is the problem? To date much of the attention in OBE has focussed on the specification of learning outcomes and less on the implementation of an OBE approach in practice. There are two requirements for outcome-based education. The first is that learning outcomes are clearly defined and presented. The second is that decisions relating to the curriculum are based on the learning outcomes specified. One can infer that a programme is outcome-based only if both conditions are met (Spady 1994). This is implicit in the model

Correspondence: Ronald M. Harden, IVIMEDS, Tay Park House, 484 Perth Road, Dundee, DD2 1LR, UK. Email: r.m.harden@dundee.ac.uk
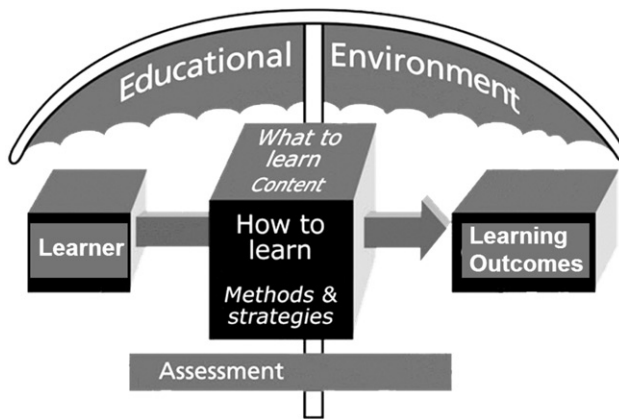
Figure 1. Curriculum planning from an OBE perspective. Decisions about the content, the teaching and learning methods and strategies, the assessment procedures, the educational environment and student selection are based on the expected learning outcomes.

of the curriculum shown in Figure 1 with judgements about the curriculum content, teaching methods and learning strategies, the assessment, the selection of students and their support and the education environment based on the agreed learning outcomes. The learning outcomes are central to and provide the underpinning for discussions and decisions by curriculum committees and planning bodies. Such decisions are meaningless unless carried out in the context of the learning outcomes.

Ostriches, peacocks and beavers

In relation to the implementation of OBE, three groups of individuals and institutions can be identified (Figure 2). The ostriches believe that learning outcomes are a passing fad, see no merit in an outcome-based approach to education and neither prepare nor take account of learning outcomes in their teaching. Ostriches will find it difficult to survive in the modern world of medical education and are likely to become extinct.

Peacocks on the other hand work hard to develop a set of learning outcomes and having done so, ostentatiously display them. The outcomes, however, are seen simply as window dressing and have no impact on decisions taken about the curriculum or the education programme. Peacocks see the task as completed when they have specified the learning outcome and the list is published. The learning outcome statement or manifesto is proudly displayed to visitors or curriculum evaluators but in practice is for the most part ignored and may even be hidden from the majority of teachers and students.

Lastly, we have the beavers who not only develop a set of learning outcomes for the course for which they are responsible but, having done so, work hard to implement OBE, basing decisions relating to the curriculum on the expected exit learning outcomes. Beavers see OBE as a way of designing, delivering and documenting instruction in terms of its intended goals and outcomes. Beavers see exit outcomes as a critical factor in designing the curriculum. They follow the advice of Spady (1988) "Exit outcomes are a critical factor, in
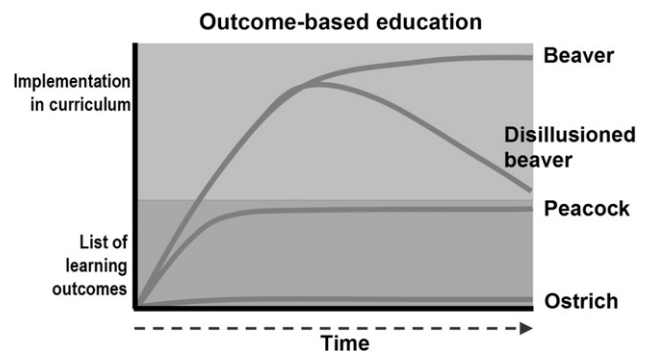

Figure 2. The response to OBE from the perspective of the 'ostrich', the 'peacock' and the 'beaver'. Only the beaver fully implements an outcome-based approach to the curriculum.

designing the curriculum. You develop the curriculum from the outcomes you want students to demonstrate, rather than writing objectives for the curriculum you already have." A worrying group are the disillusioned beavers who start off in the direction of implementing an OBE curriculum but, for a number of reasons, give up and transform to peacocks.

Figure 3. The nine dimensions in the outcome-based educational inventory. Each dimension is rated on a scale of 0 to 5.

An outcome-based education inventory

An outcome-based education inventory (OBEI) has been developed as a tool to assist teachers, schools and other bodies to assess the extent to which they are implementing an OBE approach in their teaching and training programme (Figure 3). It has been designed to be used as an evaluation or self assessment tool in the same way that the SPICES continuum is used to assess a school's position in relation to key education strategies (Harden et al. 1984). The 'systematic-opportunistic' continuum represented by the final 'S' in the 'SPICES' model is itself an indication of a move to an outcome-based approach.

In the OBEI, a score of zero to five is allocated in each of nine dimensions. The completed inventory provides a profile for the implementation of the OBE approach in the institution.
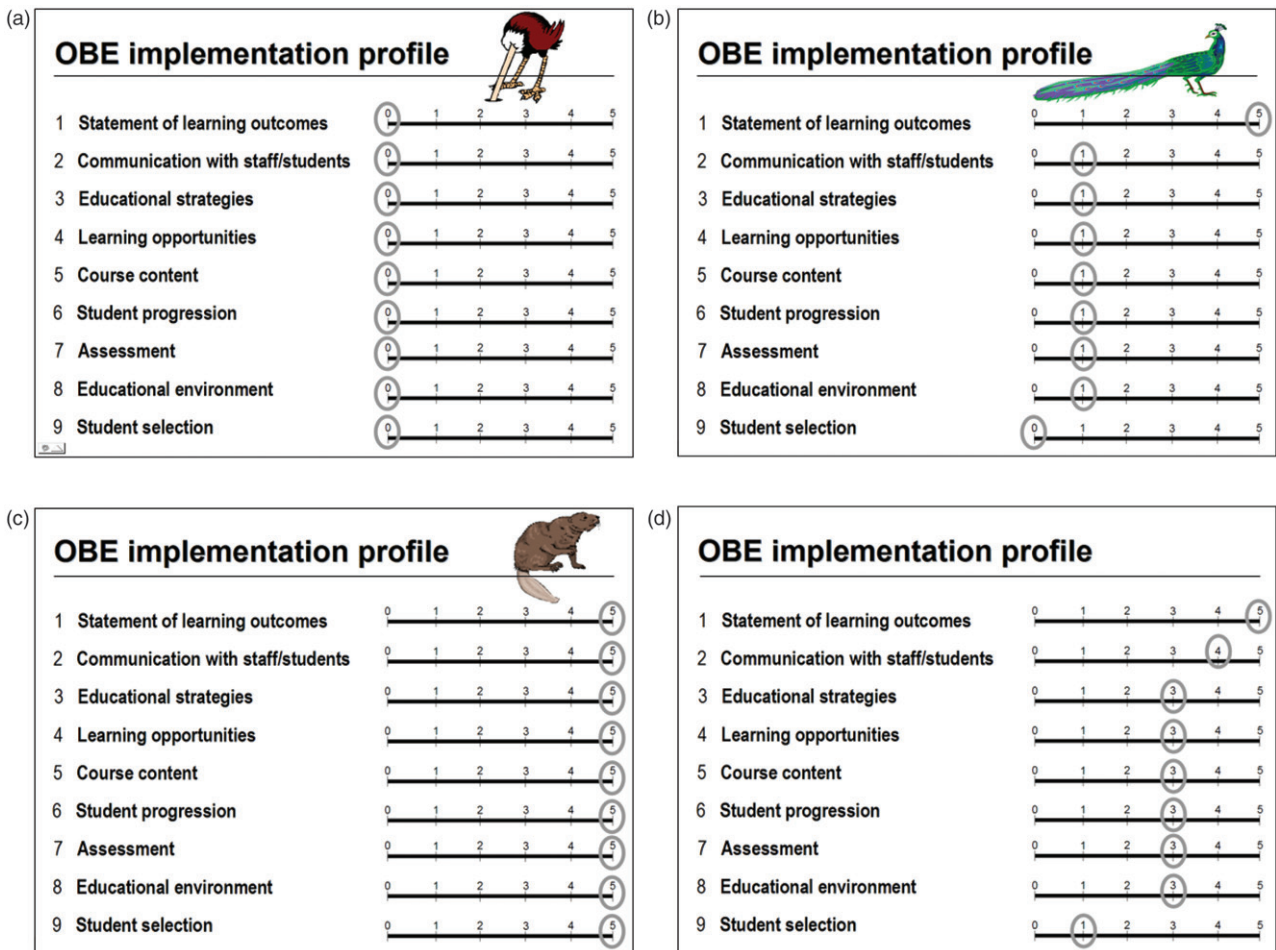
667

Figure 4. The OBE inventory profile in (a) ostriches, (b) peacocks, (c) beavers, and (d) transitions to beavers.

Statement of learning outcomes

This dimension reflects the extent to which there is a clear statement of the learning outcomes. This can range from '0' (Figure 4a) where there is an absence of any vision or consideration of learning outcomes (the ostrich) to a '5' where there is a comprehensive documented statement of outcomes. A high rating on this dimension, however, in the absence of progress or only token progress on the other dimensions, is indicative of a 'peacock' (Figure 4b).

Communication with staff and students

This dimension is a measure of the extent to which staff and students in an institution are made aware of the existence of an outcome statement and are familiar with it. Communication about the outcomes may be part of a printed document or brochure or included in the web-based information about the school. The outcomes may be introduced to the students on the first or early days of their medical course. The existence of a set of outcomes, even if communicated to the students and staff, does not mean that there is an OBE model in place unless the learning outcomes significantly influence decisions about the curriculum (Figure 4b).

Education strategies and learning opportunities

In outcome-based learning the curriculum should feature purposeful activities targeted specifically at the exit learning outcomes. Education strategies adopted such as problem-based learning, community-based learning and multiprofessional learning should reflect the learning outcomes. If, for example, the ability to work as a member of a team is a learning outcome, experience with working as a student in a multi-professional group can contribute to the achievement of the goal. The choice and use of teaching methods including lectures, small group work and independent study should reflect the learning outcomes. An approach designed to facilitate knowledge transfer may be less suitable if the intended outcome is attitude and professional development. The learning opportunities should be selected to match the learning outcomes. In so doing almost certainly a range of methods will be adopted including the use of new learning technologies. Issenberg et al. (2005) have shown, for example, how high fidelity simulators can be used in such a way that they contribute to a range of learning outcomes. E-learning too may be used to address a range of learning outcomes. The International Virtual Medical School – IVIMEDS (Harden & Hart 2002; IVIMEDS 2007) has embedded learning outcomes as the framework for the IVIMEDS curriculum map. The outcome-based map can be used both as a navigational tool

for students and teachers and as a framework for storing and retrieving learning resources.

An OBE approach to curriculum planning does not dictate the precise approach to be adopted for teaching and learning. Teachers may make use of a wide diversity of methods to achieve the expected learning outcomes. The OBE model does not assume that there is only one way to teach and to learn but it does require the teacher and learner to think critically and to select a method that is likely to achieve the expected learning outcomes. If in practice this proves not to be the case, the teacher should either review the learning outcome and assess its appropriateness or review the learning strategies with the aim of improving their effectiveness. The choice of learning approach best suited to achieve the expected outcomes may be made on the basis of the needs of the individual student.

The learning strategy can also take into account unplanned learning activities that may in their own way contribute to the expected learning outcomes. Thus in a curriculum with core and elective or optional elements, the elective components may cover content areas selected by the students while at the same time address core learning outcomes such as time-management or research skills.

Course content

A significant problem facing medical education today relates to the rapid expansion of knowledge in medicine and the danger of information overload and curriculum congestion. Consideration of the learning outcomes can lead to a meaningful discussion of what should be retained in a curriculum, what new subjects can be added and what can be omitted that was previously included. The learning outcomes may also provide guidance on the level of mastery required by a student at their stage of educational development. Should students be aware and only generally familiar with a topic but with an understanding of how and where they can get further information when required to do so, or do they need a more complete mastery of the area? Other content related issues include a consideration of the learning outcomes in areas traditionally neglected such as health promotion and disease prevention and in newer aspects of medicine such as the international dimensions if they have to practice in a global economy (Harden 2006).

It is important to recognize that the OBE model does not itself resolve disputes about content and what should be included in a core curriculum. It does, however, identify what are issues that need to be addressed and informs decisions relating to content selection. At the least, a consideration of the learning outcomes makes more transparent the content that is addressed in a course. Norman (2007) in an editorial in AHSE gives a personal account of the problems that may arise when there is a lack of such transparency – "When I offered to take over an undergraduate course in measurement for the psychology department, I asked to see the old course outline. I realized that the previous prof was teaching psychophysics, something I knew almost nothing about. So I designed a new measurement course, with the same title and the same course number, and no one ever checked about comparability. There is so little overlap that I would bet money that a graduate of my

course would score less than 5% on his final exam, and vice versa. But none of this would be obvious from a mark transcript. Everyone has a course in measurement." Provocatively Norman goes on to argue "a major and chronic frustration of medical students is that far too often a course consists of a disjointed series of lectures delivered by educators who, like terrorists, blow in, blow up, and blow out again. Actually lecturers could take a cue from terrorists who may not stick around after, but who do spend a lot of time and energy beforehand understanding every aspect of the place they intend to strike." In the implementation of an OBE approach, the teacher does spend time considering in detail the expected learning outcomes and in planning the content of the curriculum and the teaching methods accordingly.

Student progression

Learning outcomes are usually expressed as exit learning outcomes, that is the learning outcomes expected at the end of an education programme. Learning outcomes can be used to assess a student's progress towards the exit learning outcomes. A model for charting progress in OBE has been described (Harden 2007b). This OBE inventory can be applied both to the assessment of progress during the undergraduate curriculum or basic medical education and to the continuum of education from undergraduate education through postgraduate or specialist training to continuing professional development.

Assessment

Perhaps the most serious implication for an OBE approach relates to student assessment. Students can walk away from bad teaching but by its very nature they cannot do so with regard to assessment. Serious problems result when there is a mismatch between the assessment system, the teaching methods and the learning outcomes. The assessment method adopted must reflect the agreed learning outcomes and inform decisions taken as to whether a student has or has not achieved the stated outcomes. Shumway and Harden (2003) illustrated how learning outcomes can be matched to a range of assessment tools including written assessments such as multiple choice questions and extended matching items, performance assessments such as the OSCE and portfolios. The move to OBE has stimulated interest in newer approaches to assessment including the use of work-based assessment (Norcini & Burch 2007) and the use of portfolios to assess outcomes such as self reflection, critical thinking and personal development (Davis et al. 2001).

An issue often addressed in decisions about passing or failing a student on the basis of their assessment performance relates to compensation. Should a higher mark in one element of an examination compensate for a lower mark in another part? In OBE, students are required to achieve the required minimum level of competence in all of the domains and the question of compensation across different domains is therefore not relevant. In the final portfolio based assessment in the Dundee undergraduate course, for example, students have to demonstrate a satisfactory level of competence in all of the

12 domains represented in the three-circle outcome model if they are to graduate (Davis et al. 2001).

In an outcome-based approach to assessment greater responsibility is given to the student to demonstrate that they have achieved the necessary outcomes. OBE also helps to strengthen the value of feedback as a key element in the assessment process, with information provided to the student as to their level of achievement in relation to each of the outcomes.

Education environment

Increasing attention is being paid to the education environment or climate as perceived by students and trainees in medicine (Roff 2005). In OBE, the learning outcomes should inform what is seen as a desirable learning environment. For example, if the ability to work as a member of a team is a learning outcome, an educational environment that supports collaborative working is more appropriate than the more typical environment where competition is rewarded. Quinn et al. (2007) in introducing an OBE approach provided an insight into how the adoption of OBE can influence the education environment – "We are slowly transforming the educational environment to one where learning occurs with other team members; where facts about patient care are structured and displayed systematically; and where decisions are made in a collaborative manner, rather than in an environment characterized by 'name, blame and shame'. This new learning environment represents a shift in culture that acknowledges the resident as part of a system in which he or she learns while learning about the system of care."

Student selection

The previous parameters all relate to aspects of curriculum development. It can be argued, however, that an OBE approach should be reflected also in the selection of students to be admitted to study medicine given that a large number of students who are admitted to study medicine, and in some cases almost all, graduate with a medical qualification. The decision about which students to admit is, therefore, of the greatest importance. A range of approaches have been used in the selection process ranging from a purely administrative review of application form details, through assessment of personal biodata, to psychometric testing of candidates (McManus 2005). Criteria for admission, if not based on academic criteria, are often based on the personal opinion of the interviewer or selection committee as to the individual's suitability to study medicine. If an OBE approach is adopted, decisions can be taken based on the level of achievement expected of students prior to entry to medical studies in each of the outcome domains such as communication skills, decision making, attitudes and practical skills. The challenge then is to develop an appropriate instrument such as a selection OSCE to assess the expected prior level of achievement relating to each learning outcome (Eva & Reiter 2004).

670

Discussion and conclusions

OBE offers serious advantages to medical education, not least of which is a language that allows a discussion about the attributes we expect in a doctor and how these are reflected in a curriculum including what is learned, the teaching/learning methods and strategies, the assessment and the education environment. While some teachers and trainers behave as if they consider the OBE movement as a passing fad that can be ignored (the 'ostriches') and others put their energies into the preparation and display of a list of outcomes but stop there (the 'peacocks'), an OBE approach can be said to be adopted only if the teachers and trainers (the 'beavers') make decisions about the curriculum on the basis of the specified learning outcomes. There are now examples of the implementation of such an OBE approach in practice (Newble et al. 2005; McNeil et al. 2006; Samson 2006; Harden 2007a) although the approach may vary from school to school and is not without its problems (Davis et al. 2007). OBE can also be extended to help learners examine care issues in a systematic way and to give them a voice to discuss sensitive issues that may have compromised patient care and support (Quinn et al. 2007).

The reasons for a failure to deliver OBE in practice may be multifactorial. The problem may lie in a poor staff development programme, with a failure of staff to appreciate the benefits of OBE and a lack of an understanding of how the approach can be implemented in their institution. A contributing factor may be the lack of a user-friendly framework to describe the learning outcomes. Medicine is a complex field of study where a range of abilities have to be blended and applied involving a combination of acquiring basic knowledge and key skills in a range of subjects and also the appropriate personal skills and appropriate attitude. This should be reflected in the learning outcome framework. A further factor in discouraging the adoption of OBE is that the culture and environment of an institution may not support or reward time and effort put into teaching. As a result insufficient staff time may be available to undertake the systematic approach to curriculum planning necessary in OBE.

The OBE inventory described in this paper provides a tool that assists individual teachers, schools or other bodies to engage in a process of assessing the extent to which they are implementing in practice an OBE approach or whether they are simply 'ostriches' or 'peacocks'.

Note on contributor

RONALD HARDEN is Director of Education for the International Virtual Medical School (IVIMEDS), General Secretary of the Association for Medical Education in Europe (AMEE) and Editor of Medical Teacher. He was formerly Director of the Centre for Medical Education, Postgraduate Dean and Teaching Dean at University of Dundee, UK.

References

Davis MH, Friedman Ben-David M, Harden RM, Howie P, Ker J, McGhee C, Pippard MJ, Snadden D. 2001. Portfolio assessment in medical students' final examinations. Med Teach 23:357–366.

Davis MH, Amin Z, Grande JP, O'Neill AE, Pawlina W, Viggiano TR, Zuberi R. 2007. Case studies in outcome-based education. Med Teach 29.

Eva KW, Reiter HI. 2004. Where Judgement Fails. Pitfalls in the Selection Process for Medical Personnel. Adv Health Sci Educ 9:161–174.

Frank JR, Danoff D. 2007. The CanMEDS Initiative: implementing an outcomes-based framework of physician competencies. Med Teach 29.

General Medical Council. 2002. Tomorrow's Doctors (UK, General Medical Council).

Harden RM, Sowden S, Dunn WR. 1984. Some educational strategies in curriculum development: the SPICES model. Med Educ 18:284–297.

Harden RM, Crosby JR, Davis MH. 1999. An introduction to outcome-based education. Med Teach 21:7–14.

Harden RM, Hart IR. 2002. An international virtual medical school (IVIMEDS): the future for medical education? Med Teach 24:261–267.

Harden RM. 2006. International Medical Education and Future Directions: a Global Perspective. Acad Med 81 (Suppl 12).

Harden RM. 2007a. Outcome-based education: the future is today. Med Teach 29:625–629.

Harden RM. 2007b. Learning outcomes as a tool to assess progression. Med Teach 29:679–683.

Issenberg SB, McGaghie WC, Petrusa ER, Gordon DL, Scalese RJ. 2005. Features and uses of high-fidelity medical simulations that lead to effective learning: a BEME systematic view. Med Teach 27:10–28.

IVIMEDS. 2007. The cardiovascular system resources (Dundee, IVIMEDS).

McManus IC. 2005. Student selection, in: JA Dent & RM Harden (Eds), A Practical Guide for Medical Teachers, 2nd edn (Edinburgh, Elsevier Churchill Livingstone).

McNeil HP, Hughes CS, Toohey SM, Dowton BS. 2006. An innovative outcomes-based medical education program built on adult learning principles. Med Teach 28:527–534.

Newble D, Stark P, Bax N, Lawson M. 2005. Development an outcome-focused core curriculum. Med Educ 39:680–687.

Norcini J, Burch V. 2007. AMEE Guide 31: Workplace-based assessment as an educational tool. Med Teach 29. In press.

Norman G. 2007. Academic, Anarchy and digital anatomy. Adv in Health Sci Educ. In press.

Quinn DC, Bingham JW, Shourbaji NA, Jarquin-Valdivia AA. 2007. Medical students learn to assess care using the healthcare matrix. Med Teach 29:661–666.

Roff S. 2005. New resources for measuring educational environment. Med Teach 27:291–293.

Rubin P, Franchi-Christopher D. 2002. New edition of Tomorrow's Doctors. Med Teach 24:368–370.

Samson L. 2006. Curriculum-wide reform based on CanMEDS: an ambitious undertaking at UdeM. Royal College Outlook. Royal College of Physicians and Surgeons, Canada.

Shumway JM, Harden RM. 2003. AMEE Education Guide No. 25: the assessment of learning outcomes for the competent and reflective physician. Med Teach 25:569–584.

Simpson JG, Furnace J, Crosby J, Cumming AD, Evans PA, Friedman Ben-David M, Hrden RM, Lloyd D, McKenzie H, McLachlan JC, McPhate GF, Percy-Robb IW, MacPherson SG. 2002. The Scottish Doctor – learning outcomes for the medical undergraduate in Scotland: a foundation for competent and reflective practitioners. Med Teach 24:136–143.

Spady WG. 1988. Organising for results: the basis of authentic restructuring and reform. Educ Lead October: 4–8.

Spady WG. 1994. Outcome-based Education: Critical Issues and Answers. (Arlington, Virginia, USA. The American Association of School Administrators).

Swing SR. 2007. The ACGME outcome project: retrospective and prospective. Med Teach 29:648–655.