

TWELVE TIPS

Twelve tips for curriculum renewal

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Abstract

Background: Curriculum development in the health sciences usually entails a lengthy, in-depth review of most or all aspects of the curriculum. The review usually leads to the generation of a detailed report that is submitted to the Dean or executive committee of the faculty. Much has been written about the process of curriculum development but very little has been written about the important processes of curriculum renewal and revision.

Aims: Health sciences curricula, including those that are newly developed, will benefit from timely periodic revision. The revision process with subsequent diligent curriculum monitoring is called curriculum renewal. In this article, we articulate twelve tips on how to assure dynamic, ongoing curriculum renewal. The overall goal of the renewal should be to assure timely, evidence-based curriculum responsiveness to changes in practice, health care, student needs and educational approaches based on quality research.

Methods: We searched the health care education literature for articles related to curriculum development, seeking credible evidence on, and recommendations for, best practices for ongoing renewal of developed curricula.

Results and conclusions: The health sciences literature is replete with recommendations to guide suggestions for curriculum development; however, there are few credible research-based guidelines to inform dynamic curriculum renewal. Given the rapid development of research-based knowledge in health sciences education practices, there is a need to diligently monitor the ongoing successes and failures of a developed curriculum with a view to instituting large or small timely changes to assure timely curriculum renewal.

Introduction

A curriculum is “a planned educational experience that encompasses behavioral goals, instructional methods and actual experiences of the learners” (Green 2001). When a new curriculum has been developed and successfully launched, a forward looking process of curriculum renewal should be a major priority. Renewal should be characterized by thoughtful evaluation, revision, ongoing responsiveness and modernization. To assure that the curriculum remains responsive to emerging societal trends, health care innovations, and novel education practice, the renewal should be a dynamic process designed to enhance student learning. All health sciences curricula should be modified and regenerated on a regular basis (Davis & Harden 2003). Given the ever-changing circumstances influencing the conduct of learning, curriculum developers and reviewers must embrace flexibility and ongoing responsiveness to meet teacher, student and societal expectations. In other words, the curriculum should be perpetually responsive to change and regular evidence-based renewal must be accepted and valued by educational leaders, teachers and learners.

Practice points

- Health sciences curricula require regular revision.
- Revision and renewal should be informed by emerging societal trends, health care innovations and education practices.
- Evidence based curriculum renewal must be valued by educational leaders, teachers and learners.

Tip 1

Articulate the reasons for curricular change and ongoing curricular renewal

The forces for change in health sciences education are legion and unremitting. Among the prominent forces are: societal pressures; shifting disease patterns as exemplified by the obesity epidemic and the prevalence of Type 2 diabetes; and new understandings of educational theory and practice. Proliferation of novel, expensive technologies, including sophisticated simulation materials, also have a role in influencing curricular change.

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One unremitting risk in health science curricula is “information overload”. The information overload problem, by itself, is reason enough for change in health sciences curricula. History reminds us of the persistence of the “overload” problem. In November, 1899 William Osler wrote in the Montreal Medical Journal that *The students try to learn too much and we teachers try to teach them too much, neither perhaps with much success*. Almost 100 years later GB Newman wrote, *The load upon students’ memories has become excessive as to require some measure of relief* (Newman 1988).

Regardless of the reason for change or renewal, be it a recurring problem or a new trend, the motivation must be clearly stated, relevant and meaningful. Many change efforts, including those designed to develop curricula, fail in a predictable fashion. An easily predictable circumstance for failure is for the curriculum development committee members to deliberate wisely, celebrate the completion of the process, and then disperse.

Kotter provides a useful framework for leading change and the members of the development committee should familiarize themselves with his guidelines for leading change that are equally applicable to successful transformation of a curriculum (Kotter 2007). The first step in introducing change is to: “establish a sense of urgency” for change among the faculty. Failure to establish a sense of urgency may account for some of the failures to drive momentum-resistant people out of their comfort zones. An influential committee, or even a powerful duo, depending on the breadth of change contemplated, should be charged with “selling” the change and bringing other respected leaders on board. An influential committed coalition can help to inculcate other leaders into the change vortex by developing a picture of what they see as a vision for the future. Step 2, “communicating the vision”, is critical. This group of strong opinion leaders should be part of the vision process with a mandate to facilitate the next 6 steps of change as advocated by Kotter. They should be empowered to concentrate on efforts to spread the word about the curriculum change and to alert other school leaders that change will be followed by timely ongoing positive curriculum renewal. Real change takes time. As a result, the members of the development committee should recognize and celebrate achievement of short-term gains. Not all obstacles will easily fall by the wayside. Early successes will be appreciated by the committee members and the faculty members, including some who were skeptical of the need for change.

Tip 2

Build a strong, influential curriculum renewal team

To avert faculty ennui and to encourage “buy in”, it is advisable to develop a strong curriculum renewal team long before the curricular development committee has completed its job. Membership of the renewal team should include opinion leaders, course directors, high profile teachers and at least one member of the current curriculum committee. The size and makeup of the renewal team should be partly

determined by the breadth and depth of anticipated curriculum renewal. Core team members should include faculty leaders in education and the health sciences as well as experienced teachers. The complexity and degree of curricular change envisioned by the development committee will also influence characteristics of the renewal group. For example, a curriculum for a brief learning experience, such as the introduction of students to a high-tech learning facility, can be developed by a small group of two or three persons from the renewal committee.

Ideally the curricular renewal team should be mandated to monitor the literature on, and respond to, influential curriculum research, disease prevalence, and technological innovations. There may be benefit to inclusion of competent, committed lay members on the renewal team to represent the changing needs of society, as well as practitioners from allied disciplines and schools. The renewal team members should canvas recent graduates of the course or program for their insights based on their experiences. Finally, faculty members with credible education expertise and understanding of education theory can be co-opted by the renewal committee during discussions of research-informed pedagogical practices.

A broadly representative renewal team as outlined above can mitigate any tendencies of committee members to filibuster for pet ideas. Flexibility must permeate the team discussions with the sense that “there is no one best choice for framing a curriculum as a whole or any of its parts. A curriculum should simply be fit for the purpose and context of its day” (Grant 2010).

Tip 3

Identify prevalent social, political, economic and technological trends

At the outset of deliberations, the renewal team members should consider the influence of the increasingly narrow specialization of clinical departments and the limited representation of generalists in many health sciences teaching environments, including the environment at university-affiliated hospitals. Specialist practice profiles and “space age” technology can be irresistibly appealing for junior learners, so early student exposure to specialists may bias, and interfere with, the desired evolution of learning. Rare, “exciting” or esoteric disease is not the best field for learning. Learning from, and exposure to, common medical problems should be the norm.

Situated learning, a process wherein learners transform because of participation in authentic activities in the clinic, office, or hospital ward, is most effective when there is deliberate exposure to generalists and to prevalent disease in the community (Weatherhall 2011). Worldwide, a number of troublesome influences have crept into health science education frameworks. Working conditions for health care providers who do the teaching have been threatened by daunting workloads and politically driven health reforms. Health care institutions which have strong profit-driven motives may not be ideal sites for learning. Even excellent community practices are at risk of being overstretched by increased patient

expectations, thus limiting the opportunities for reflective teaching and learning.

Changes in the local and global burden of disease have had worrisome influences on curriculum renewal as evidenced by the impact on students' learning experiences of the AIDS epidemic, rising inner city violence, the obesity epidemic and the increasing prevalence of type 2 diabetes mellitus. Awareness of these issues must be considered in the curricular renewal process. On the other hand, skewed clinical experiences as a result of repeated exposure to dramatic, "interesting" medical problems may hamper leaning about common, important diseases.

Another challenge to learning in some active teaching hospitals is the overwhelming time commitment required of chronically ill patients whose care could be much better delivered in a long-term care facility. Effective curriculum renewal teams should insist that learner experiences be characterized by broad exposure to: excellent generalist role models; common important illnesses; and an environment wherein profit is not a primary driver for clinician teachers.

Tip 4

Ensure that curriculum outcomes drive teaching and learning

At the outset of a renewal process it is useful to address the predictable, contentious issues related to important, but troublesome, education concepts and terms. "Objectives", "Goals", "Learning outcomes" and "Behavioral objectives" are but a few of the terms used to describe how and what students should learn in a curriculum. Confusion surrounding these terms invariably clouds discussions between teachers and curriculum framers. For example, development of useful behavioral objectives may be confounded by the difficulty of developing practical definitions (Rees 2004). Exercises designed to develop curriculum objectives, and to assure that learners and teachers understand them, frequently produce lengthy documents which are too cumbersome to be practical.

When curricular modification is anticipated, renewal team members should recognize that many teachers in the trenches have difficulty understanding, let alone applying, grandiose concepts such as: "statements of intent", "overall aims" and "general learning outcomes". Many experts still favor development and application of clear, concise "objectives" which are acceptable to all or most of the teachers. Given that many teachers are skeptical about the benefits and practical utility of comprehensive goals and/or objectives, it may be useful to expose the skeptics to the overarching idea that teachers should strive to facilitate attainment of broad goals including: cultivation of the intellect; individual self actualization; personal and social improvement; social transformation and organizational effectiveness.

In a 1985 education publication describing overarching goals, the author suggested that health care teaching should aim to train potential health care workers to completely "undertake the responsibilities expected of them in professional practice" (Bandarananayake 1985). Thirty years later

this aim still has merit. "Blind adoption" of an outcomes-based model may not be the optimal approach (Rees 2004). To obviate the problems inherent in what the school wants the graduates to look like, we recommend an early vigorous debate that leads to consensus on what the graduates should know and be able to do.

Tip 5

Promote an evidence-based approach to curricular renewal

Regeneration and enhancement of learning experiences must entail diligent ongoing review of the major health sciences education publications for articles on curriculum to determine what is most appropriate for individual contexts. The results of the review should then be summarized, written down and distributed to all program coordinators and teachers. Fixation on curriculum as a "planned educational experience that encompasses goals, teaching and learning methods and outcomes" may be difficult given the bewildering array of available models, each with detractors and proponents. Whichever curriculum model is favored, four structural elements should inform all curriculum renewal discussions: (1) curriculum content, (2) learning approaches, (3) assessment practices and (4) evaluation practices (Prideaux 2003).

Among the curriculum models currently used in the health sciences, six dominate the education literature: (1) Subject or disciplined-based curricula (Grant 2006). (2) Problem-based curricula (Barrows 1996; Colliver 2000). (3) Experiential learning curricula (Kolb 1984). (4) Spiral curricula (Harden 1999). (5) Clinical presentation curricula (Mandin et al. 1995). (6) Outcomes based curricula (Rees 2004). The problem-based learning curriculum model (PBL) has gained a foothold in universities in many countries but there is surprisingly little concrete evidence demonstrating that the PBL approach is superior to others. The clinical presentation curriculum organizes clinical and basic science instruction around clinical problems. Whatever descriptive label is affixed to the curriculum, situated learning should be prominent (Mann 2011). Critical to the success of this approach is the development of a community of learners who work in the collective (Douglas & Brown 2011) while striving to become successful health care practitioners. Active student engagement in the community over time gradually leads to acquisition of knowledge, skills and values of a professional. The overriding theme is that a curriculum should be chosen for learning and learners, not for teaching and teachers. Good teachers can provide good explanations of information that help learners understand.

Tip 6

Critically review the teaching methods, educational strategies, and learning resources

Lectures play an important role in most schools because they are an effective, efficient way of transmitting information and integrating concepts (Matheson 2008). However they are

quantitatively on a decline at many schools because they are prone to produce passive student involvement in the learning process, especially if the lecturers lack charisma and speaking expertise. In many schools, lectures have been replaced by small group-based learning activities, problem-solving workshops and self-directed learning. Case discussion groups, role-plays and group-dependent or independent learning projects have also gained favor because they feature active learner engagement and are conducive to the development of communities of learners. Other worthwhile learning initiatives driven by adult learning principles include those that provide opportunities to pursue special individualized student interests. Examples of these are: travel to different learning sites, community hospitals or clinics for the disadvantaged, and service in underprivileged communities or countries. The use of information technology and computer-based learning is the norm in most progressive medical schools as are on-line chat groups and learning modules to package content. The rapidity of technological change requires a lively ongoing overview and renewal of how the technology is being used. The renewal team members must regularly monitor the use of technology to assure that it is appropriately exploited while guarding against excessive reliance on expensive gimmicks.

Last, but certainly not least, is the rapidly advancing field of simulation technology. Simulation is especially applicable to the teaching of procedural medicine, patient interviewing and professional behaviors (Scalese et al. 2008). These technologies have opened up vast new learning opportunities for students at all levels and should be carefully considered.

Although there is no “one size fits all” approach to teaching and learning, patient-based self-directed approaches, communities of learners, and simulation approaches, all sprinkled with some well-delivered lectures, should be prominently displayed on the “education menus” of a medical school.

Tip 7

Ensure that sound educational theories inform the transformation and renewal of teaching and learning methods

Fortunately, in the education literature, there is an impressive body of easily digestible research on curricular design and teaching methods (Bleakley 2009; Mann 2011; Prideaux 2003). Convincing research demonstrates that students should be exposed to an environment which encourages self-reflective learning and self-critical learning. Four aspects of learning influence students’ ability to acquire and store new knowledge in memory in a retrievable manner. The first aspect relates to the fact that “understanding the meaning of a concept strongly influences learning”. Second, “the context of the learning” is critical to knowledge acquisition. Learning in a clinical setting provides exposure to a powerful influence, sometimes called “the romance of medicine”. Third, “processing specificity” is critical. This implies that the manner in which something is learned will influence one’s ability to retrieve what is learned. Fourth, “memory is significantly influenced by practice of the task of remembering”. In other words, expertise is a function

of time spent on learning (Ericsson 2004). Awareness of these principles can help to guide the renewal process.

Curriculum renewal team members must assure that the applied curriculum aggressively eschews fact overload while emphasizing learning of concepts and dealing with clinical scenarios which embody the concepts to be learned. Thus, it behooves curriculum designers to construct student experiences which promote deep learning and critical thinking. For example, a module on high blood pressure might include the presence of a real patient or a “paper case” outlining a patient’s medical story. Subsequently, the instructor would encourage group discussion focusing on the meaning of the disorder and its consequences for cardiovascular disease. Constructivist theory posits that such a clinical example will facilitate students’ creation of their own understanding of the pathophysiology and prognosis of high blood pressure. Discussion of the problem in the students’ community of learners will further enhance understanding and remembering (Mann 2011; Vygotsky 1978). This constructivist theoretical framework may lead renewal committee members to embrace the clinical presentation model.

Tip 8

Develop criteria for teacher selection, development, evaluation and reward

There is a dearth of research on teacher selection for health care instruction. In the recent past, teaching in the early years of medical school fell to highly trained research scientists who had been recruited to the medical school because of their scientific prowess. There was a tacit assumption that skilled researchers would be skilled teachers. In the clinical components of the curriculum, specialist physicians in teaching hospitals would do the teaching on the inpatient clinical services or in the ambulatory care clinics. It was uncommon to have significant involvement of generalist practitioners in teaching settings. Similar teacher selection models have been applied in other health care disciplines including nursing, occupational and physical therapy.

Recently, the educator role is demanding more attention among health care workers recruited for patient care in offices, clinics and hospital wards (Weatherhall 2011). Increased recognition of the importance of the teaching role has been accompanied by renewed faculty enthusiasm for staff, or faculty, development (McLeod et al. 2011; Steinert et al. 2010) and in remuneration for teaching. Further beneficial developments have been observed in teacher recruiting practices. During the last 15 years there has been a significant increase in interest in education courses, faculty development workshops, and medical education masters programs. Established health care professionals who are interested in teaching and education research are enriching their professional lives by acquiring education expertise in courses and masters programs. Furthermore, for both generalist and specialist physicians, teaching without compensation is no longer acceptable. Stipends are often symbolic in nature, but recognition of teaching prowess and success is reward in itself. Formal teacher awards, many with monetary supplements, are routine

in many European and North American medical schools and are gaining favor in other jurisdictions. Course directors responsible for teacher selection should cast the net widely and downplay teachers' "need for developing a teaching dossier for promotion". Teachers should be selected because they are passionate, committed communicators who understand students' needs and who are ready to adopt proven advances in education practices and education technology. Past approaches have entailed flurries of attention to replenishing the educational mission of health professional schools immediately following introduction of a new curriculum. That approach is no longer valid. Dramatic changes in education theory and learning environments today require ongoing repetitive renewal targeting all health care teachers and administrators. Educators must assume the responsibility of encouraging and facilitating renewal and university leaders should recognize and reward teachers at all levels.

Tip 9

Assure appropriate content and sequencing of learning experiences

Selection of content to be emphasized must be informed by the known societal burden of disease. One appealing process for the selection of relevant curriculum content begins with development of a large inclusive and superfluous list of clinical problems known to exist in the population. The problem list can then be subjected to a broad-based Delphi process using participants representing both health care providers and recipients of health care (McLeod et al. 2004). The rapidly expanding knowledge base to which learners will be exposed requires that the curriculum focus on a limited number of important representative problems (D'Eon & Crawford 2005). Success in developing a manageable content list will require vigorous resistance to pressure from "experts" and "specialists" who frequently overestimate the importance of learning details of disease in their field. For over a century, information overload has burdened students in the caring professions. The tendency of curriculum designers to comprehensively cover the field has been derisively labeled "carcinoma of the curriculum" (Abrahamson 1978).

Appropriate sequencing of curriculum content is best served by a strategically planned mixture of basic science and clinical problems. One effective sequencing model sees representative clinical problems introduced early with applicable physiology and basics woven into the discussion of the clinical problems (Mandin et al. 1995). The other end of the curriculum spectrum entails early introduction to basic sciences followed by clinical problems (Davis & Hardin 2003). In the latter model, it is recognized that regular "hints of relevance to clinical practice" can foster enthusiasm for learning the basic concepts. In the opinion of many, optimal learning will be assured if renewal team members select a limited number of important, representative clinical problems and strategically interweave basic sciences into the description of those problems. In addition, members of the renewal team should, at regular intervals, conduct mandated on-site visits to the lecture theatres, small group teaching facilities and clinical

teaching sites to monitor the content, sequencing, and integration of basic and clinical elements. Monitoring experiences and provision of constructive feedback will help instructors and learners alike.

Tip 10

Plan a multidimensional learner assessment protocol

Once the curriculum developers have produced a model of "the product" or type of student desired, it should be relatively straightforward to determine the success of the renewed curriculum. Fortunately it is known that a learner's ability to solve problems is highly dependent on the availability of the knowledge relevant to that problem (Prideaux 2007). Students should be able to show what they know and can do, and formal assessment approaches are available for the tasks.

The recognition that "assessment drives learning" should inform the use of assessment vehicles in the health care setting. Students will take seriously the material on which they will be tested, so the assessment process should be informed by, and reflect the curriculum (Weatherhall 2011). There is a general consensus that no one assessment vehicle is totally adequate; thus a multidimensional process is required. The outcome of quality assessment research is that many schools, drawing from the business world, are moving to "360 degree" assessment of learners. (Allerup et al. 2007; Rees & Shepherd 2005).

Summative judgment of the learners' knowledge, skills and behaviors acquired as a consequence of the formal curriculum should be preceded by ongoing formative assessment. Many well-developed assessment processes are available to test learners' knowledge, skills and behaviors. These processes should be part of both the summative and the formative student assessments (Cook 2010). Experience reminds us that the tenor and breadth of assessment practices need constant monitoring. In some disciplines, multiple choice questions dominate; in others, broadly-based judgments of knowledge skills and behaviors are used. Members of the curriculum renewal team are ideally placed to act as beneficent insurgents by regularly visiting the various teaching units to observe, comment on and renew the assessment processes.

Tip 11

Evaluate the curriculum renewal

Given the dramatic explosion of information sciences and technological advances, ongoing curriculum renewal should be a prominent activity in the health sciences. Health sciences educators frequently introduce new educational approaches and technology but they may fail to heed the "stop, look and listen" aphorism. Ongoing curriculum renewal should mandate that we evaluate the impact of any change we introduce. Not only is such an approach beneficial to learners and educators, it is also an important part of our mandate to be socially accountable for the changes made and for monitoring the outcomes of the changes. Although there are several useful

frameworks to guide the evaluation process we are comfortable with Kirkpatrick's curriculum evaluation framework (Kirkpatrick 1994) but others may suffice. This framework has four levels of evaluation, each with different emphases. Level 1, reaction, focuses on participants' reactions to the overall experience. Level 2 involves learning. The learning can focus on knowledge, skills, behaviors and/or attitudes. Ideally "pre-post" judgments should be used at this level. Level 3 involves evaluation of use and application of what the participants have learned in the curriculum. At this level, educators must make difficult decisions with respect to when, what and how to evaluate. Level 4 is probably the most important but, it is also the most difficult outcome (or set of outcomes) to measure. Ideally, educators should decide what constitutes optimal results and what constitutes a positive impact. Experience reveals that educators rarely evaluate at this level. Wise health care educators incorporate a plan for intermittent curriculum evaluation from the outset of the project. Content renewal should not be an add-on or an afterthought.

Tip 12

Remember that the learning climate significantly influences learning

Medical school curricula usually devote considerable space to outlining the structure, content and expectations of the learners but rarely address the nature of the learning environment or the "climate" in which the curriculum will operate (Genn 2001). It has been suggested that the curriculum should be thought of as "an interactive process involving values and ideas, people and material resources in the school" (Johnston 1992). Those critical elements of medical school learning environments and the unique impact they have on student achievement may be regarded as the soul and spirit of the school. The climate involves not only the learners, but also the teaching and auxiliary staff whose well-being may have a significant impact on the lives and learning of students. For example, if teaching by intimidation and bullying are permitted, student morale and enthusiasm for learning will be suppressed. A climate dominated by overwhelming fact overload can seriously impair student morale and derail enthusiasm for learning.

A renewed curriculum requires solid cultural influences as cornerstones for the development of a successful climate. The support stones include: student-centered teaching; teacher openness to criticism; and a dedication to helping students develop independent self-directed learning behaviors. Student achievement is inextricably linked to students' personal wellness and satisfaction. The school administrators, represented by the curriculum renewal team, must evaluate and monitor the learning climate and assure that negative influences are rooted out before they take hold and poison the environment. In this role, the renewal team members should have a high profile in the ongoing workings of the school and they should have the support of the Dean of Health Sciences.

Conclusion

Health Sciences curricula are prone to stagnation. Vigorous timely curriculum renewal can energize learners and instructors and health care recipients will be the beneficiaries.

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