

## Twelve Tips for Medical Education Reform

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### Abstract

**Background:** A review of the literature reveals that there are some commonly used practices of medical education reform, though there is no one-size-fits-all formula.

**Aim:** The following tips outline a practical multifaceted approach to reform in medical education, including some for reform efforts that involve an international partnership.

**Method:** These tips are based on the available literature and the authors' experience in medical education reform in a cross-cultural context. Each recommendation is explained and then briefly illustrated where appropriate with the experience of a medical school in China that recently carried out successful reform with the adaptation of a U.S. curriculum and assistance from a U.S. medical school.

**Conclusion:** These tips can provide useful rules-of-thumb to medical educators and medical school leaders who are interested in curriculum reform. Some are particularly useful for reforms that involve international collaboration.

**Keywords:** Medical education reform, medical curriculum reform and medical education in China

### Article

#### Introduction

Medical education reform is needed in many developing countries as their medical schools are still confined to traditional and stagnant curricula and teaching methods (Frenk, et al., 2010). A large number of Asian medical schools are revamping their education, often by following the footsteps of their Western counterparts (Lam & Lam, 2009; Majumder, 2004). Some medical schools in China, for example, have been learning for more than a decade from western countries with great renown for quality training of medical professionals (Lam & Lam, 2009; Qiao, et al., 2002). "Medical education in a well-developed western country" is often used as a norm against which to examine the condition of medical education in China (Zhang, et al., 2013). An often used paradigm is partnership between a Chinese medical school and a Western medical school, with the latter providing curricular models and assistance, and the former adapting new frameworks and approaches. In Africa, many

medical institutions have benefited from partnership arrangements where they collaborate with European or American schools on capacity building (Frenk, et al., 2010; Mullan, et al., 2013).

The goals of medical education reform are similar across different regions, as evidenced by published literature on reform in Asia, Europe, and Africa. These goals include: increased opportunity for students to develop independent and collaborative learning ability; curricular integration within and across basic sciences, clinical sciences, social sciences, and humanities; increased instruction in professionalism, ethics, and the social dimensions of healthcare; earlier clinical experience; primary care exposure; assessment methods that emphasize competency and that have an educational role; and evaluation of curriculum and teaching effectiveness (Hou, 2014; Lam & Lam, 2009; Likic, et al., 2005; Mullan, et al., 2013).

A recent example of an international partnership in medical reform is the Wuhan University Medical Education Reform (WUMER) project, where Wuhan University (WU), China, overhauled its medical curriculum with the assistance of the University of Chicago (UC). With the above-mentioned goals in mind, WU adapted and piloted the medical curriculum and pedagogy of UC, resulting in significantly greater student and faculty satisfaction with the quality of medical education (Dong, et al., 2014; Sherer, et al., 2013). In this article, we suggest some practical tips on medical education reform in general and on international partnerships in particular. These tips, based on literature and the authors' experience, are also illustrated with relevant WUMER experience where appropriate.

## Tip 1

### **Mobilize the school for change by providing a clear vision and by developing a shared, new understanding about educational goals, teaching, and learning.**

All change involves anxiety and struggle and cannot be assimilated unless understanding is shared by all participants involved (Fullan, 2001). A shared understanding of the reform is critical to the mobilization of faculty, buy-in from all involved, and the development of commonality across courses and departments. Participants need to be on the same page regarding the school's new educational goals and approaches.

A shared understanding can be achieved in several ways. The first is to provide sufficient opportunities for faculty and students to learn about the reform. School leadership creates a vision for the change and must communicate it to faculty and students by clearly articulating the need for and content of change, the process of change, and faculty and students' roles in this change. Furthermore, participants need multiple venues to learn about and understand information about the change.

A second way to achieve shared meaning is by inviting all faculty and students to participate in the evaluation aspect of the reform, asking them to assess the status quo, give suggestions for change, and evaluate the implementation of the innovations. When participants' opinions converge, a sense of consensus is established. This consensus is critical for successful change, because a shared understanding of goals is needed to achieve coordinated implementation and subsequent refinement of the new curriculum (Fetterman, et al., 2010).

At WU, a shared understanding was achieved in a stepwise fashion. First, the medical school leadership, including the Reform Committee, conducted a review of literature on the status of medical education in China and developed countries in the West. Then the leaders made site visits to UC to directly observe state-of-the-art teaching methods. A clear vision for change was formed and

shared with all faculty members. This was followed by multiple visits to UC by WU faculty members led by course directors. In addition, UC faculty visited WU to explain and demonstrate the rationale and methods of UC's medical curriculum and pedagogy. Finally, WU administered a survey which asked all faculty and students to evaluate their traditional curriculum and to propose changes. The survey revealed that an overwhelming majority of participants were unsatisfied with the traditional approaches and that their suggestions for change were all in line with the goals of the reform (Sherer, et al., 2013). This survey identified participants' consensus and helped them articulate a common understanding.

## **Tip 2**

### **Build a leadership structure to lead the reform at all levels of the school's operation.**

Leaders facilitate change by providing an organizational structure as well as a clear vision (Lindberg, 1998). The structure is composed of the dean who oversees the direction of the change, an executive or assistant dean who conducts the day-to-day operations of the reform and who oversees curricular coherence, and directors of individual courses who directly lead course level innovations. Course leaders form the core faculty leadership groups who work in the trenches, planning, implementing, and refining changes in all aspects of the curriculum.

School leadership also puts mechanisms in place to make sure that leadership meetings and course faculty meetings occur regularly. At these meetings, participants assess existing curriculum and resources, make plans for change, orchestrate resources for change, assess implementation of the change, and make improvements. These meeting times allow key reform participants to work together to make the reform actually happen.

It is important to broaden leadership ranks and develop a broad base of support for the innovation (Kaufman, 1998). From the outset, engage and train junior faculty as key current participants and future leaders in the reform. Also important is the engagement of senior students by training them as teaching assistants who facilitate the implementation of some new teaching and learning methods such as small-group discussions.

## **Tip 3**

### **Encourage active participation of stakeholders in all phases and aspects of the reform process.**

Key stakeholders are school leaders, faculty, and students. During the preparation phase, encourage all faculty and students to participate in the reform and ask them to voice their opinions of the reform's content and direction. During the implementation of each course, involve all stakeholders in course evaluation (see Tip 11). Fetterman and colleagues (2010) have argued that involving participants in reform evaluation encourages their participation in system changes, because the more closely stakeholders are involved in reflecting on curricular changes, the more likely they are to take ownership of the results and influence decision-making. Faculty members, especially key course teachers, can be involved in the creation of evaluation tools. They should be given the power to reform their own courses and encouraged to conduct action research that addresses instructional issues. Students can study their new educational experience. Senior students can be trained as teaching assistants who facilitate younger students' group work.

Fullan (2001) observed that students are often the missing participants in reform. As one of the key change agents, students should have the opportunity to assess their educational experience and thereby contribute to reform. While actively involved in all phases of the reform, both students and

faculty become its *participants* in the true sense of the word and influence the reform process. Active participation leads to internal commitment which in turns contributes to the success of the reform.

#### **Tip 4**

#### **Provide training opportunities for faculty members to enhance their pedagogical knowledge and leadership skills.**

Faculty development is a necessary strand in curriculum reform and is critical to its success. Training should respond to what faculty members need in order to effectively carry out the reform and can be done by: 1) regular training workshops in the school; 2) faculty exchange between collaborating institutions for observation and learning; 3) creating a school-wide culture of collaboration within and across departments; and 4) supporting faculty members' engagement in educational research by providing funding and other resources.

Faculty development should not be conducted as discrete or one-shot workshops. Rather, its efforts should be systematic and continuous, and its mechanisms are needed to facilitate the reform and support the continuous improvement of teaching practice after the reform has been institutionalized. Remember that no matter what new pedagogical methods are introduced in the reform, the method is far less important than the skill and the excitement of the teacher (Shatzer, 1998). Meaningful change depends on deep change in teachers' understanding rather than fidelity to a mandated program.

As an example, WU sent key faculty members to UC for onsite training, and UC course leaders in turn gave workshops at WU regarding course level reform. WU also established a faculty training center during the reform to make faculty training systematic and continuous.

#### **Tip 5**

#### **Secure and orchestrate resources to support change.**

Many resources, such as facilities, personnel, technology, and collaborators, are needed to carry out the reform. For example, the use of student small-group discussion sessions as a teaching method requires more classrooms than the traditional large lectures in auditoriums; multiple small-group sessions require additional teaching staff; online teaching resources entail internet access; the creation of community medicine clerkships requires the medical school to seek collaboration with community health centers; these centers' physicians may need training in how to be effective preceptors; and faculty training needs funding support.

WU increased its resources on multiple fronts. As an example, a new teaching building was built to accommodate the reform's needs for more teaching space. The school also established relationship with six community health centers in the City of Wuhan that would serve as training sites for the new clerkships in community medicine.

#### **Tip 6**

#### **Provide stipends, protected time, and incentives for participating faculty leaders, course directors, and student teaching assistants.**

In a review of eight U.S. medical schools' reform experience, Kaufman (1998) found that at most of the institutions, many faculty members resisted participation in the innovations because they thought added work would be required and because they saw no rewards for the effort. Kaufman therefore recommended the use of tangible incentives to encourage and reward participation.

It is important to provide participating faculty sufficient time and incentives. The introduction of new curricular material and new pedagogical methods is challenging, and the provision of incentives – whether in protected teaching time, in monetary reward, in teaching credits towards promotion, or in public recognition – will be invaluable to creating a culture that honors and promotes quality improvement in medical education.

At WU, the granting of protected time to reform courses' faculty was started by reform leaders, though to an incomplete degree. Similarly, senior students were engaged to be student teaching assistants with financial or credit compensation. One practice in UC that will be adopted at WU is a special day to celebrate teaching, i.e. 'Medical Education Day', which recognizes the top teachers, innovative practices, and best student activities in teaching.

### **Tip 7**

#### **Focus on main curricular change points.**

For China as well as the rest of the world, the goals of medical education reform are similar, as evidenced by published literature (for example, Gerrity & Mahaffy, 1998; Likic, et al., 2005; Mennin & Kalishman, 1998; Zhang & Lee, 2013). The following are among key curriculum changes points:

- expose students to patient contact experience in their first year in medical school
- integrate subjects where appropriate to highlight interdisciplinary connections and to reduce unnecessary redundancies
- use case-based discussions to support integration within and between basic and clinical sciences
- increase the opportunity for students to develop independent and collaborative learning ability
- establish clear objectives for clerkships and build clerkship structures that ensure consistency in all clerkships, including opportunities to practice clinical thinking
- enhance curricula in the social dimensions of medicine
- include opportunities for students to learn how to conduct research
- increase opportunities for formative evaluation of students

For an illustration of this tip, please see a study by Dong and colleagues (2014) that describes the content and sequence of the reform curriculum at WU.

### **Tip 8**

#### **Align assessments of students with new curricular goals.**

Assessment change is an essential part of curricular reform. According to Mennin & Kalishman (1998), assessment is one of the most difficult aspects of curriculum change. Nonetheless, it is one of the most important aspects as well, partly because exams drive learning to a large extent. Schmidt (1998), when summarizing the experience of eight U.S. medical schools' reform, concluded that the failure to implement congruent assessment system from the outset can be a stumbling block to the implementation of the new curriculum. Thus, along with curriculum development, it is critical to develop assessment systems that align with the goals of the new curriculum.

Assessment practice should match the new curricular content and structure, including knowledge integration, application, and students' independent learning. Assessments should also follow the

tenets that are currently believed to be sound, such as an emphasis on higher-order thinking and the use of assessment to inform learning (Nitko, 2004).

Assessment changes at WU were initiated by course and clerkship directors. Traditionally, WU only administered final exams with a small number of periodic quizzes for the purpose of giving students grades. The reform courses added a midterm exam and more periodic quizzes to help students review and adjust learning efforts. The integrative application of knowledge was assessed in some courses, while faculty of other courses found such assessments challenging to create.

### **Tip 9**

#### **Modify the borrowed (foreign) curriculum and pedagogy to meet local needs.**

The contents and methods of a foreign curricular model should be modified according to national guidelines for medical education, healthcare needs of the people, learning needs of students, pertinent international standards, and availability of resources. Experiences in developed Asian countries have shown that what has worked in the West may not be successful in Asia because of different social and cultural dispositions, and that the integration of local initiatives and Western models can greatly enhance the applicability and outcomes of reform in the Asian context (Lam & Lam, 2009). Methodological appropriateness does not lie so much in “what methods” as in “how” and “when” the methods are used separately and synergistically. It is also important to remember that traditional ways of teaching are not necessarily incompatible with newer methods, and that a wide range of strategies should be exploited to satisfy the learning needs of all students (Dugdale, 2001).

When adopting UC’s basic sciences courses, WU increased instructional hours to make sure that its students, who had entered the medical school directly from high-school, would grasp the courses’ material. Wet labs from the traditional courses were mostly incorporated into the new courses (whereas the UC courses include a much smaller number of wet labs). WU teachers also replaced some UC clinical cases with ones collected from their teaching hospitals to make the cases locally relevant. UC’s expectations of clinical clerkships were modified to suit the patient mix and clinical practices at the WU teaching hospitals. Finally, topics that were not covered in the UC curriculum but would appear on China’s licensing exams were taught in WU’s reformed curriculum.

### **Tip 10**

#### **Work toward withdrawing partnership support by building the reform school’s capacity and by encouraging the school faculty’s ownership of the reform.**

Reform must provide a means for shifting ownership from external support systems to support systems internal to the school (Coburn, 2003; McLaughlin & Mitra, 2001). Eventually, the partnership will come to an end, and the reform school will be on its own. Throughout the reform process, the school needs to prepare for its “independence” by enhancing its capacity and by developing widespread ownership of the reform. Capacity is built through faculty training, the nurturing of a culture of collaboration, and the enhancement of necessary resources. Ownership is developed through active participation by all stakeholders.

New approaches tend to be sustained, even after the partnership dissolves, when the school assumes ownership of the change process. Thus, from the outset, aim at teacher ownership rather than external accountability, and locate ownership of the reform in the school rather than in the partnership. Ownership is evident as teachers construct their curricula, student assessments, and course evaluation methods, and as they engage in action research to solve instructional problems.

At WU, extensive training of faculty and senior students, as well as the construction of a new teaching facility mentioned above, contributed to capacity building. Also, by enabling faculty to directly modify and design each course, their ownership of the new curriculum and teaching methods was accomplished, and the reform curriculum was thoroughly embraced by the faculty.

## **Tip 11**

### **Document and evaluate the reform process.**

Reform project evaluation is research within the project. Reform should be guided by systematic and reliable evaluation research, as “in the absence of program evaluation, change is likely to drift or to be driven by anecdotal evidence and rumors” (Lindberg, 1998, p. S10). Evaluation means that existing curricula and pedagogies are examined and diagnosed through rigorous measures, and innovations are also monitored by ongoing assessments. Such evaluations can provide directions for reform, feedback for the reform process, and identify successes and issues in the reform. Decision-making based on evaluation research will be more scientific, democratic, and transparent. Besides, sweeping reform may produce political resistance and discontent, but if evaluation studies provide evidence in support of the change, it can win stakeholders’ trust.

There are three main dimensions to evaluation: curricular content and pedagogy analysis, students’ learning outcomes, and participants’ perceptions. The first dimension consists of analyses of curriculum material and its corresponding instructional methods. The second focuses on evidence of students’ learning. The perceptions of faculty and students are an important source of evidence on the basis of which to measure the quality of curriculum and instruction (Eyal & Cohen, 2006).

WU used evaluation throughout the reform. At the preparation stage, the traditional curriculum was assessed by expert teams, school leadership, faculty, and students. During the implementation stage, almost every course was surveyed, and some course surveys included both attitude measurements and knowledge assessments of students. When the first group of reform curriculum students was graduating along with their traditional curriculum peers, a graduation survey was administered to gauge both groups’ perceptions of their respective educational experiences and to compare the views of the two groups.

## **Tip 12**

### **Sustain the reform by addressing three aspects of the reform: depth, length, and breadth.**

Successful implementation of the reform does not guarantee its continuation. Hargreaves and Fink (2004) argue that three things matter to the sustainability of change: depth, length, and breadth. Reform has depth when it produces fundamental changes in pedagogical principles and when it improves important aspects of students’ learning; breadth of the reform is achieved when it is extended to other schools to transform medical education across an entire system or nation; and length refers to the duration of the reform over long periods of time instead of fizzling out after the first flush of innovation (Hargreaves & Fink, 2004). Successful change often takes longer than expected (Lindberg, 1998). School leadership and faculty need to maintain their commitment to the reform to achieve length, depth, and breadth – to make the reform stay.

At WU, the work launched in 2009 has continued and been enhanced ever since, in spite of leadership successions. All students, beside those who are already in the pilot, will be educated in the new curriculum in 2015. As a continuation of the reform, WU has recently begun to renovate its residency training programs. In 2012, WU founded and hosted the first Sino-American Medical

Education Reform Forum where educators from about 20 medical schools in China attended and shared their experiences. This Forum will be held every three years to promote the exchange of ideas, the deepening of reform, and the transformation of medical education across the nation. Finally, a wealth of presentations about the reform by WU faculty at local and national meetings, as well as a substantial number of papers published in Chinese and English literature, has also suggested the depth of the change.

## Conclusion

Change in medical education is a worldwide phenomenon (Majumder, et al., 2004). Advanced educational goals and related approaches mentioned in this article have been introduced in the institutions in most of the developed countries, while many developing countries have yet to make greater efforts to orient educators and policy-makers about the state-of-the-art trends to bring about desired changes (Majumder, et al., 2004). In today's world of medical education where reform is imperative, we hope that this article has offered some useful ideas for reformers.

## Declaration of interest

The authors report no conflict of interest. The authors alone are responsible for the content and writing of this article.

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