

INNOVATIVE TRACKS AT ESTABLISHED INSTITUTIONS FOR THE EDUCATION OF HEALTH PERSONNEL

**An experimental approach
to change relevant to health needs**

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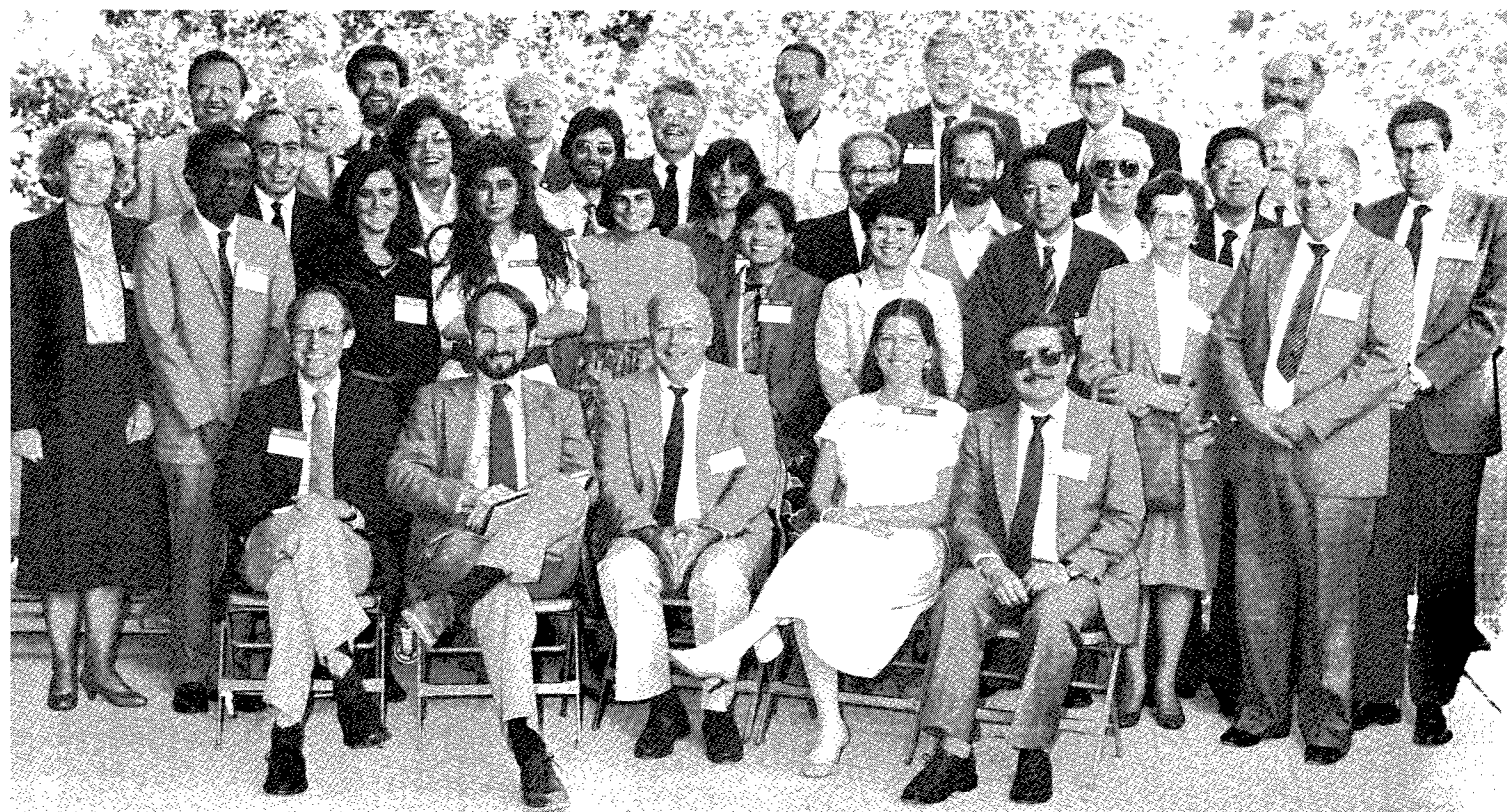
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Foreword—World Health Organization

The World Health Organization (WHO) is an intergovernmental organization with, at present, 166 Member States. Its constitutional objective is “the attainment by all peoples of the highest possible level of health” (1) and its supreme governing body, the World Health Assembly, resolved in May 1977 that “the main social target of governments and WHO in the coming decades should be the attainment by all citizens of the world by the year 2000 of a level of health that will permit them to lead a socially and economically productive life” (2). This is popularly known as “Health for All” (HFA). Then, in 1978, the Alma Ata Conference on Primary Health Care (PHC) declared PHC to be the key to the achievement of HFA.

WHO is thus deeply concerned with the problems of “health”, but what does it have to do with “education”? It is clear that the optimal use of the right kind of trained personnel is a most important component in the fight for health, and thus in the movement for HFA. Hence the Organization’s long-standing interest in human resources development in general and especially in education and training of health personnel. For a long time the major emphasis of this programme was on promoting the production of more health personnel, especially of physicians. However, time has shown that although this drive for quantity has been successful, and in some cases even too successful leading to overproduction of certain categories of health personnel, the relevance of the personnel trained to the health needs and demands of the population has often been far from satisfactory. The emphasis of the programme has therefore slowly shifted (3) to the promotion of improved training of health workers to ensure the increased relevance of such training to national health priorities, that is to say to HFA through PHC.

There are relatively few training institutions where there is a clearly demonstrated concern with this aspect of “quality” of the training programme, or where it is well understood that “one is excellent only if one is relevant” and that “the highest standard in medical education for any country is that which is most responsive to local need” (4). Yet these few institutions, whose main characteristic is that their training programmes are community-oriented and use the community, in addition to hospitals, as a major learning environment, were convened by WHO to a meeting in 1979. They decided to form a Network of Community-Oriented Educational Institutions for Health Sciences. The Network has since grown in strength and number. But just as the founding members were all newly established institutions, those which have since joined

are also mostly new. Institutions with conventional training programmes seem to find it most difficult to move away from the well-known hospital-based, exclusively patient-oriented pattern. The notable exceptions, which so far only seem to reinforce the rule, are those institutions, a mere handful, which decided to allow the development of an additional, alternative programme. These are called "experimental", "parallel", or "alternative" "tracks" and often serve as a community-oriented "option" within the framework of an otherwise traditional institution. These "tracks" thus represent the hope for change of these older, established institutions in the direction of relevance to HFA through PHC.

WHO looks on these "tracks" as representing the germs of the future which, if they do well in fertile ground, can grow, blossom, and bear fruit not only in the form of graduates who are able and willing to serve society according to its needs, but also by influencing their institutional environment towards change.

The writer has had the privilege of visiting several of these "track" programmes and is convinced that at present this is the best, if not the only way, to promote change in established institutions towards HFA through PHC. There is clearly a need to make these programmes and their valuable experiences widely known and so help others who want to change to get started, avoid pitfalls and proceed more safely and rapidly. Hence the idea of a conference attended by such schools and of a publication of their pooled wisdom was attractive. This report, by sincerely analyzing experiences, successes and less successful approaches, may provide not only the vitally necessary stimulus for change but also those most useful "hints" which will help those who decide to start moving on this so difficult path.

WHO will always be interested in stimulating change, and in collaborating with those who are involved in changing the education of health personnel to promote the relevance of graduates' service to Health for All through Primary Health Care.

Dr. T. Fulop
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Foreword—Network

The “winds of change” are blowing in medical education. In various parts of the world, medical schools are experimenting with new ways to educate future physicians. Some of these experiments are well publicized from the outset; others have been going on quietly for many years—not much fanfare, just steady, determined achievement. These adventures began in different ways: a clear-eyed vision by a tenacious dean; the product of a group of dissatisfied educators from a single institution; or a national mandate for change and experimentation.

In recent years, these risk-taking institutions have found each other, discovering a kindred spirit among themselves. This has led to discussions and associations where problems are presented, solutions are proposed, and results are reported. More importantly, these linkages have provided mutual support and encouragement, and have led to creative activities which might not have happened had the institutions remained isolated. A particularly powerful feature is the international nature of this movement, where each experiment, though rooted in a particular cultural setting, can nevertheless provide insights that are useful in other countries.

A fine example of all of this was the October 1986 Albuquerque meeting, described in this book. Medical educators from five different countries and eight institutions met around a common interest: the use of a “track strategy” to introduce new methods of educating physicians of the future. The format of the meeting reflected the style of innovation in these institutions. There were specific questions explored by small working groups. There was an unhesitating display of problems, mistakes and surprises. Creative solutions were suggested and by the end of the meeting, there was a clear sense by both individuals and institutions that they were part of something bigger than their own program. They also saw that there was much more to do.

The Network of Community-Oriented Educational Institutions for Health Sciences was very pleased to be a sponsor of this meeting, since it contributed directly to the Network’s objectives. These are to help those educational institutions determined to provide future health workers with training that is relevant to the health needs of a given population. This Network, founded in Jamaica in 1979, now has more than twenty full members, with many more associate members and correspondents. Its activities, coordinated through a secretariat in Maastricht, Holland, include communications, exchange of teachers and students, special meetings and task forces.

One of these task forces (Task Force 7, on "Program Evaluation") is based at the University of New Mexico.

This university has fostered one of the most important medical education experiments in the United States in the past ten years. It is fitting that this group of adventurers has been charged by the Network to lead its efforts in program evaluation, since the New Mexico experience itself demonstrates this activity. From the outset of the Primary Care Curriculum adventure, questions have been posed about this educational intervention, data obtained, and modifications made based on this systematic analysis. This new knowledge about medical education has been published, and is available to the world-wide medical education community. Not adequately captured in these publications is the spirit of adventure, self-criticism and collegueship which pervades the New Mexico curriculum. The message for both teachers and students seems to be, "medical education can be fun".

This balance of science and enjoyment also characterized the Albuquerque meeting. These proceedings of that meeting, through case studies and summaries, highlight some important general principles of academic planning. They are applicable to more than just the "track strategy" in medical education. They will be useful to any individual or institution interested in new approaches to the education of health professionals.

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Preface

"By the end of the Albuquerque Conference, I no longer felt like a Mexican. I felt more like a citizen of the world."

Pablo Moreno Silva, National Autonomous University of Mexico

The world of medical education urgently needs more effective approaches to change.

Medical education is facing global criticism for two primary reasons. First, it lacks relevance to the tasks to be performed in primary health care systems. As a consequence such education fosters a maldistribution of its graduates by geography and specialty. Second, the explosion of scientific information makes traditional curricula increasingly irrelevant, because they are based solely on what is known today, to the exclusion of how to learn what will be known tomorrow. Educational reform is desperately needed.

And yet, only 1.5 percent of medical schools have adopted innovative programs which address these issues. These schools, which are mostly new ones, have introduced radically different learning methods—in community-oriented learning and in problem-based education—the results of which are proving to be very effective.

However, these results have not yet had a substantial influence on the 98.5% of medical schools which adhere to the traditional programme as well as methods of teaching.

One basic reason for this may be that the innovative schools have failed to provide a clear road map leading to change. Such a map must not only show the goals to be reached, but it must also delineate the many obstacles along the way, and the most efficient paths to follow.

A conference was convened in Albuquerque, New Mexico, in October 1986, in order to produce such a map. This book is the result.

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* *

The Albuquerque Conference was sponsored by the Network of Community Oriented Educational Institutions for the Health Sciences, initiated and supported by the World Health Organization and hosted by the University of New Mexico School of Medicine. It was attended by representatives of eight innovative health science

institutions from China, Mexico, the Philippines, Thailand, and the United States. Each of these institutions has addressed the above problems in medical education in one specific way: by establishing an innovative curricular track. It is a curriculum distinct from, but running parallel with, the already existing curriculum. Although each group of innovators faced different problems and obstacles, each created needed change within its established, traditional institution by using the same strategy.

Introduction

Significance

The problem of maldistribution of physicians by geography and specialty is a consequence of such factors as emphasizing learning in urban, tertiary-care hospitals, and selecting teachers who are predominantly subspecialists. One educator noted these consequences:

“Doctors find themselves unaccustomed to assess and evaluate the health care needs and priorities of their own country and its people. They are incapable of providing or implementing preventive programs. They are unprepared to work in the slums of the cities or to manage a rural health care team.” (1)

This sentiment was forcefully expressed in the World Health Organization’s Conference in Alma-Ata (1978) which confirmed the goal of “Health For All By The Year 2000.” (2)

The information explosion, particularly as it pertains to medical science, has led to calls for education reform: utilizing problem-solving rather than rote memory, stressing active rather than passive learning, and emphasizing student-centered rather than teacher-centered education. These are recommendations in the Association of American Medical Colleges’ report on “Physicians for the Twenty-First Century.” (3)

But why haven’t established health science institutions responded to these calls for change? The basic reason is that they are steeped in tradition, jealously guarding departmental power bases and the status quo against newer, “alien” ideas. There is little incentive to change. While experimentation is encouraged by traditional institutions in the laboratory or clinic, it is often resisted in the school itself. Faculty members who would like to initiate changes in such institutions find themselves facing what seems to be an impenetrable wall of resistance. They need assistance in breaking through that wall.

Educators who are contemplating change in traditional schools can greatly benefit from careful analysis of strategies employed by schools that have succeeded in bringing about fundamental curricular change. They can select appropriate strategies and adapt and apply them to their own institutions.

The World Health Organization financially supported a conference of schools that have attempted such change. The Albuquerque Conference pooled the experiences of eight established health science institutions from around the world; institutions in

which the walls of resistance had been breached. It is the hope of the conference planners that readers of this volume will absorb from its pages some of what the conference participants learned from one another. Each program faced a different set of institutional problems and constraints, as well as a different community environment. Each had to make different choices in order to survive and thrive on its home turf. But despite these differences, they shared a common strategy in attempting to create change in their established, traditional institution: each introduced a separate, innovative curricular track aimed at greater relevance to health needs. WHO gave financial support to the conference because it believes such separate tracks are a means to introduce into the curricula, in a relevant way, the health needs of the population.

The schools participating in the meeting are given below, in chronologic order of the years in which students were first admitted to their tracks:

- The National Autonomous University of Mexico's General Integrated Medical Program (PMGI, or A-36 Track). Mexico (1974)
- Michigan State University's Upper Peninsula Medical Education Program, (UPMEP). USA (1974)
- The University of the Philippines' Institute for Health Sciences -Palo, Leyte program (UP-IHS). Philippines (1976)
- Chulalongkorn University's Medical Education for Students from Rural Areas Project (MESRAP). Thailand (1978)
- The University of New Mexico's Primary Care Curriculum (PCC). USA (1979)
- Rush Medical School's Alternative Curriculum. USA (1984)
- Harvard Medical School's New Pathway. USA (1985)
- The Shanghai Second Medical University's Problem-Based Curriculum. China (1987)

Each of these institutions sent two to four representatives to the conference. For four days participants shared their experiences, research outcomes, successes, and failures in order to produce a document which would serve as a practical guide for other health science institutions contemplating such a strategy.

Why select an innovative track as a vehicle for these changes?

Conference participants described seven important reasons why an innovative track can be successfully employed as an agent of change:

1. It minimizes threat

An innovative track allows a small group of committed faculty members and students to try out new types of curricula and new educational methods without initially forcing the rest of the faculty either to change what and how they teach or to participate in the innovation.

2. It bypasses departmental control

The track brings together educators, from different departments, who place students' educational needs above departmental concerns. The goal of offering an integrated curriculum can be undermined by traditional departmental control of curriculum and evaluation.

3. It provides a protected environment

A track allows room for ideas to be tested by participating faculty and students who are drawn to the innovation. The educational concepts devised by planners of the innovation need to be tried out and modified until it becomes clear which ones are workable and which are not. Innovators need time and space to develop and modify new approaches.

4. It allows extensive student involvement in the community

A track offers planners an opportunity to build an entire curriculum de novo around priority health problems, and to include the community and a diversity of health services as important sites for learning. In contrast, the traditional medical student's week is filled with scheduled course hours on campus and in sophisticated university hospitals (4). Curricular content is designed by departments which compete for time, and which infrequently look beyond their own courses to the overall learning needs and future careers of students. Scant time is available for student exposure to health problems in the community, even though this is where virtually all health problems originate, and where most care is given.

5. It offers alternative approaches to learning

The innovative track, which is student-centered, is adapted to the diversity of students' learning styles. It gives them a larger responsibility in organizing their learning.

6. It provides an ethical approach to educational innovation

It is ethical to test an innovative program with a small group of volunteers, before it is mandated for all students.

7. It permits experimental comparison

An innovative track running alongside a traditional one within a single institution allows innovators to evaluate its effectiveness using students in the traditional track as controls.

Preparation for the conference

Each institution prepared a document which included a case study describing its program and a self-analysis of the development and outcome of the innovative track as a strategy for change. It is the belief of the conference planners that an in-depth evaluation of this strategy is of more value to educators in traditional medical schools than a simple description of each program.

To facilitate a cross-comparison between programs, each school was asked to address nine questions:

1. What are the principal characteristics of the innovative and traditional track programs in your school?
2. What were the rationale, motivation, and major incentives for initiating the innovative track?
3. How was the track initiated and organized at the outset?
4. What were the social, economic, and political forces supporting and resisting change?
5. What strategies were developed to overcome barriers to change and to develop support forces?
6. What were the roles of funding, legislative mandate, and leadership in the planning and development of the innovative track?
7. What were the roles of other institutions in helping to develop the innovative track?

8. To what degree has the innovative track influenced the conventional track, and vice versa?
9. What have been the program outcomes, and what are the desired future developments?

Responses to these questions facilitated comparison of program strategies and assured that sufficient attention was devoted to each element of change.

Finally, each school completed a questionnaire for inclusion in these proceedings. This provided numerous fine details about the program for comparative reference purposes.

Tasks of participants

The conference was conducted almost entirely in four small, problem-oriented group sessions, with representatives from different institutions. Topics discussed in the small groups focused on the key elements of the change process. Each group pooled its experiences and made recommendations about steps in bringing about change.

The task assigned to each participating school was to discuss, in the small-group format, their successes and failures; how they had corrected mistakes; and how they had learned from others. This was not only a difficult and complex assignment, but also an uncomfortable one for many of the participants. We are more comfortable presenting a favorable face to the world—describing our achievements. Describing our failures can be embarrassing, yet it is of inestimable value to other educators, since they can more easily identify with, and learn from, an open account of problems they themselves face. This is the basis for a road map to change.

Each group of participants at this conference had to contend with other problems as well. Not only were they writing about themselves, but also about their entire medical school and, at times, their universities. Each had to be politically sensitive to the broad audience which was reviewing their work “at home”. They had to balance their enthusiasm for their achievements with a sober reflection on how the innovative track appeared to those not intimately involved in its creation, or in its existence. The fact that the participants were willing to reveal so much is a credit to their integrity, trust in others, and belief in themselves.

Learning from each other

Sharing ideas and problems with others around the world can be both comforting and enlightening. It can stimulate new approaches at one's home institution.

"I learned many useful strategies for dealing with problems which will arise while implementing an innovative program—how resistance to change can be handled, ways of evaluating an innovative program."

Zenaida C. Varona, University of the Philippines

"While leadership is important, I've learned it can also be an impediment if the leader is too rigidly wed to one approach, or if the innovation becomes too closely identified with one leader."

S. Scott Obenshain, University of New Mexico

"I was comforted by seeing similar problems elsewhere. Some are even in worse shape than we are, especially in shortcomings of evaluation, faculty opposition, and inadequate support outside the institution."

Charas Suwanwela, Chulalongkorn University, Thailand

"I was struck by several things: 1) the powerful commonalities of problems across schools and countries, 2) the importance of leadership in catalyzing change in complicated environments, and 3) clarification of my own thinking about evaluation."

Gordon Moore, Harvard University

"I learned from other track schools that have been in existence for many years, how a program moves from early survival to development. I realized the importance of evaluation methodology and how we might design a suitable model for our track. I also realized that problem-based learning is meaningful for all learners."

Li Xue-min, Shanghai Second Medical University

The names of conference participants and addresses of participating institutions are included at the front of the book to enable readers to make personal contact with them. We hope that such contacts will help to widen the circle of interchange and influence of this small sample of eight schools which are attempting curricular change by means of an innovative track.

Organization of this book

The purpose of this book is to inform educators about using the innovative track as a strategy for change. We wish to encourage others to consider employing suitable aspects of this strategy in their own settings.

Power structures, sources of support, and patterns of constraint vary so greatly among institutions, that it would have been impossible for the participants in the Albuquerque Conference to formulate universal recommendations for change. Instead, what they have learned has been distilled into a core set of strategies. It must be noted that not all strategies are suitable for all institutions.

Part I presents these strategies in a format roughly approximating to the sequence of change.

1. Getting started.
2. Building support, overcoming resistance.
3. Evaluation.
4. Networking.
5. Options for the future of the track.

Part II presents the results of the detailed questionnaire completed by each participating school. We compare institutions, noting common trends and glaring differences in approaches, circumstances, or outcomes. We also discuss factors that might explain the trends that emerge from the data.

Part III finally presents the case studies of the eight participating institutions. They are the core text of this book. They provide readers with clear insights into the evolution of eight different innovative tracks which are in various stages of development. Each case study is an attempt at honest, institutional reflection and self-analysis which we hope will encourage others to share their own histories.

The need for change in medical education toward increased relevance to health needs is both urgent and far-reaching. The authors hope that when readers complete this book, they will take action—will press for needed institutional change. If this book facilitates such action, the Albuquerque Conference will have fulfilled one of its key missions—an effective networking of strategies for timely change in medical education.

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Part I

Recommended Strategies for Implementing Change

Introduction

Numerous strategies for implementing change were identified during the Albuquerque Conference. Individual ideas began to coalesce into key recommendations. Despite varied local circumstances, there emerged a series of successful strategies for implementing changes in established, traditional institutions. These strategies are presented in this chapter, along with illustrative examples. An overview of the five areas of recommendation, along with 23 suggested strategies are listed in Fig. 1.

Fig. 1. Recommended strategies for implementing change

Getting started

1. Explore external motives for change
2. Explore internal motives for change
3. Select for appropriate leadership qualities
4. Obtain educational resources
5. Seek financial support
6. Don't plan for too long—begin!
7. Develop a widely acceptable admissions policy

Building support, overcoming resistance

1. Build broad-based support early
2. Avoid isolation
3. Compromise (but not on principles)
4. Develop faculty support through interactions with students
5. Develop student evaluation methods that are widely accepted
6. Describe the innovative track as an "Experiment"

Evaluation

1. Evaluate short-term results
2. Evaluate long-term results
3. Evaluate the "process" of change

Networking

1. Establish linkages between institutions in developing and industrialized countries
2. Develop linkages between similar, established institutions
3. Develop a "sister school" relationship
4. Affiliate with a larger, recognized organization or network

Options for the future of the track

1. Maintain the innovative track
2. Combine the two tracks into a hybrid
3. Convert the entire curriculum to the innovative method

Getting started

Strategy 1: Explore external motives for change

It is important to explore the broader context in which motives for change exist outside the institution. For a change to achieve broad support it must appear relevant to an audience wider than the small group planning the innovative track. In fact, the innovation should, in its own way, address society's pressing health needs. Innovators should seek to link their innovation with important forces outside the institution, forces which are also seeking change.

Examples: 1) The governments of Thailand and Mexico, as well as the World Health Organization, have determined that an overproduction of medical doctors, and neglect of primary-care training, are detrimental to achieving basic, acceptable primary health care for all people. The innovative, community-oriented tracks at the Chulalongkorn University in Thailand and at the National Autonomous University of Mexico draw support from their national governments because these innovations fulfill a national need.

2) Medical educators at the Shanghai Second Medical University were dismayed by their students' lack of independent thinking and their passive behavior. The educators developed an experimental, problem-based curricular track to address this problem. At that time China was undergoing a sweeping modernization which included reform at all levels of education. There was, at the local and national levels, encouragement of local educational reform initiatives. Shanghai's experimental track was thus able to gain very broad-based support, and national recognition.

Strategy 2: Explore internal motives for change

It is critical for track planners to seek within the institution a broad base of support. All institutions feel some need for educational improvement. But the degree of this need, and its constituency, vary with the times and the local environment. Track innovators should identify and tap into this undercurrent of potential support. They can broaden the number of educational issues addressed by the innovation, choosing those which appeal to a wider audience.

Examples: 1) The University of New Mexico's program focused initially on producing an increasing number of graduates seeking

primary-care careers in underserved areas. Problem-based learning was one vehicle employed to prepare the students. Other educators in the institution were desirous of producing graduates who, regardless of career goals, were more scientific thinkers than those that were being produced by the traditional teaching methods. Track planners therefore widened their emphasis on exploring innovations in problem-based learning, and offered this new teaching method as a vehicle for achieving the goals of their colleagues. This substantially increased the attractiveness of the program for other educators and drew them into the support base.

2) Michigan State University's Upper Peninsula program was initiated to address the problem of physician shortage in the State's northern rural communities. The development of its problem-based curriculum, however, served a broader need on the main campus. It provided curriculum materials for an alternative, problem-based learning track running alongside the traditional curriculum. Therefore, greater support for the Upper Peninsula program was drawn from the main campus than would otherwise have been the case.

Strategy 3: Select for appropriate leadership qualities

The following aspects of leadership were found to be the most important to the successful institution of innovative tracks:

The ability to:

- 1) influence others (charisma).
- 2) be both credible and convincing to a broad institutional audience.
- 3) be an advocate who believes strongly in the innovation.
- 4) be a risk-taker with considerable self-assurance.
- 5) be flexible and able to compromise.

Those who generate the initial ideas for the curricular innovation are not necessarily those most capable of leading a successful effort at translating those ideas into a program acceptable to the institution. Leadership may emerge from various levels in the institution—dean, senior or junior faculty, or students. Innovators must identify and recruit leaders who can successfully promote the innovative program inside and outside the institution.

Example: The Deans or Vice Presidents at Michigan State University, the University of the Philippines, Harvard, and Shanghai

Second Medical University took very strong leadership roles in promoting their respective innovative tracks. Each leader was exposed to a personal risk by supporting a curriculum so alien to tradition. But each was successful by virtue of his ability to generate enthusiasm for the innovative track. These leadership skills enabled each of them to convince resistant faculty leaders to participate in the planning of the new track. In this way, the fledgling track was identified with respected faculty, and a sense of “ownership” was generated among them.

Strategy 4: Obtain educational resources

Obtain sample case problems, curricular syllabuses, and learning resources from other innovative schools. Review, revise, and adapt these to your own program goals and curricular needs.

It is enormously costly in faculty and staff time to create curriculum and resource materials de novo. Initially, time is better spent preparing faculty to facilitate student learning using the innovative methodology. The success of the innovation is more dependent on the quality of teacher-student interaction than on the specific curriculum materials as long as these are easily available to students. Further, the most creative ideas about how to revise case problems come after students have worked with the materials. It is very hard for innovative-track planners to predict beforehand how well particular problems will suit specific program objectives.

Example: The two oldest innovative tracks (both of which admitted their first students in 1974), at the National Autonomous University of Mexico and at Michigan State University, were introduced before there were other models to emulate. Curriculum development in both institutions was a Herculean task.

The more recently established programs at New Mexico (1979), Rush (1984), and Harvard (1985), had the benefit of a review of curriculum materials from earlier programs, as well as from totally problem-based schools like McMaster. This enabled the process of adapting materials already in existence to be adopted, and so reduced start-up curriculum costs. Even so, new curriculum materials still underwent substantial revision, based on the reactions of the first classes of students.

Strategy 5: Seek financial support

All innovative tracks require special financial allocations because of the costs incurred in the development phase of any program. The source of such funding can be reallocation of existing institutional budgets, or external government or foundation grants.

Financial support for the track helps to validate the worth of the project, and encourages acceptance within the institution. For a traditional faculty who fear that there will be extra, uncompensated time-demands made by the innovative track, additional funding can allay some of this concern. In some cases, external funding can buy department participation, while in others it can buy time for the innovation to be sampled and accepted by traditional educators.

Examples: 1) The tracks at Rush, Shanghai, and Mexico began without external grant support, but with internal reallocation of funding. This provided a highly visible validation of the programs by top administration, which resulted in a broadening of acceptance among the faculty.

2) The programs at Michigan State, New Mexico and Harvard began with considerable private foundation and government support. With these funds, the programs were able to “buy” faculty participation from individual departments.

3) Over six to eight years from their initiation, programs in the Philippines and New Mexico, that had been externally funded, were able to prove their merit to a sufficient degree for the Universities themselves to assume financial responsibility for them.

Strategy 6: Don't plan for too long - Begin!

It is important for the innovative track to become a reality expeditiously. And it is important to note that the most efficient and creative program development takes place after students arrive, not before, when planning is done in a vacuum.

Numerous reservations, doubts, and questions concerning the innovative track are certain to emerge both within and outside the program. While thoughtful planning and broad-based input can relieve some anxiety, waiting too long can actually magnify doubts and paralyze decision-making. Having real, live students participating in the program focuses faculty and staff energy productively.

Example: Track planners at Michigan State, New Mexico, and Rush felt pressured to begin quickly in order to demonstrate the

worth of their innovative ideas. To help initiate their tracks, they even settled for very small class sizes—(Rush, 8; New Mexico, 10; and Michigan State's Upper Peninsula, 10 in alternate years). In each case the curriculum was being developed as students arrived, but the mere fact that they started, precipitated the needed creative focus to plan further program developments and to recruit faculty.

Strategy 7: Develop a widely acceptable admissions policy

Criteria for selecting students into the innovative tracks vary with the goals of the programs. In order to facilitate acceptance of the innovative track by the institution as a whole, track planners should consider incorporating aspects of traditional admissions criteria.

Most tracks have found that they have had to compromise on original admissions plans to conform more closely to the admissions criteria of the institution. When the track is new, it is most vulnerable to external criticism and it desperately needs the acceptance of traditional educators who wield far greater power in the institution than do the innovators.

Example: Applicants from rural and underserved areas often have lower scores on entrance examinations than do applicants from urban communities. However, the likelihood of their returning to practice in rural or underserved areas is higher. The rural, primary-care-oriented Medical Education for Students from Rural Areas Project (MESRAP) program in Thailand, and New Mexico's Primary Care Curriculum initially selected students more on the basis of rural background than on more traditional academic criteria. However, when the students from rural areas performed poorly on standard basic science examinations in medical school, the innovative tracks were widely criticized by traditional educators within the institutions. To protect the innovations, both tracks responded by raising the academic criteria for admission to their programs.

Building support, overcoming resistance

Strategy 1: Build broad-based support early

It is critical that track planners build support from different departments within the institution and, where applicable, from different community and government constituencies.

Example: Planners of Michigan State University's Upper Peninsula Program attracted the attention of the state legislators by recruiting broad community support. This legislative interest, in turn, encouraged administrators of the University's main campus in East Lansing to support Upper Peninsula's innovative track. Further, early community involvement encouraged community physicians to serve as clinical faculty in the new program.

Strategy 2: Avoid isolation

There is a tendency on the part of core planners to remain too isolated from the rest of the institution. Often, the planners' intent is to unveil their innovation only after all the major problems have been ironed out. This can be a serious mistake. Isolating the program from the institution diminishes the ability of others to contribute productively to the innovative track, or to feel any sense of responsibility for the program. Track planners may even be characterized as arrogant or elitist, and their innovation may be resented, or even rejected, for reasons of personal affront rather than for any characteristics of the innovation itself.

Example: Track planners at the National Autonomous University of Mexico kept their program physically apart from traditional faculty in order to develop their community-based curriculum. They thereby generated resentment of their innovative track by many traditional educators. In addition, when they desired the assistance of traditional basic scientists to develop resource materials for their track students, the quality of that assistance was grossly inadequate. Since the basic scientists had not sufficiently grasped the goals or methods of the new track and had not been kept informed, the materials they developed were not relevant to its needs.

Strategy 3: Compromise (but not on principles)

In almost every criticism there is a kernel of truth or a sentiment that needs to be understood. While innovators should defend and protect the basic values underlying their new track, they should show flexibility in compromising on specific educational methods.

Innovators honor their critics and offer them ownership in the innovative track by taking their criticisms seriously and by modifying the track on the basis of this feedback. The innovation is usually strengthened by incorporating appropriate input of its

critics. Compromise must be understood as a willingness of the innovators to conform, to a degree, with the common goals of the institution. Unfortunately, many innovators confuse basic program values with specific educational methods. They hold rigidly to methods, such as maintaining a particular size of tutorial group, while sacrificing needed institutional support for more important and basic program values, such as ensuring that students have major control over their own learning.

Examples: 1) The Dean at Harvard desired that his plans for a problem-based, student-centered tutorial curriculum should also incorporate a seven-year continuum of experience—from the second year of college through internship. Despite almost universal rejection of this aspect of his proposal by faculty and students alike, the Dean held so tenaciously to it that he almost lost support for the entire project over this one element of the program. When he finally did compromise on this point, plans for the innovative medical school portion of the proposal proceeded with little opposition.

2) The track planners at Michigan State's Upper Peninsula campus and New Mexico not only desired a problem-based, student-centered, community-oriented structure for their curriculum, but they also proposed a career-ladder approach to education. Track students would first become physician's assistants (PAs), work for a year as PAs, then return to the track to become physicians. But the national medical school accrediting body told New Mexico planners that their track would be in jeopardy if they "bastardized medical education with physician assistant training". And local physicians in the Upper Peninsula opposed the physician assistance training progression proposal to the point that they would have rejected the entire Upper Peninsula medical education program if that proposal were left in. The planners therefore abandoned the career ladder method, but maintained the basic values acceptable to the accreditors and physicians.

Strategy 4: Develop faculty support through interaction with students

Students' enthusiasm for learning is the most successful force for convincing faculty to participate in the innovative track.

There are many roles faculty can be asked to play in developing and running the new track. These roles include administration, preparation of curriculum materials, and evaluation. But none offers more immediate reward than working with students who are

enthusiastic about learning. Intellectual debates about the new learning method, and educational research data supporting its value, are not as convincing to skeptics as hands-on, personal experience with the students.

Example: The Shanghai program planners recruited faculty for their proposed problem-based track by encouraging small experiments within each department. Faculty would test the new curricular ideas by hands-on tutoring sessions with their own students, using case problems developed at Shanghai. It was a highly effective technique, and not only allayed fears about the new methods, but also built support for the innovative track.

Strategy 5: Develop student evaluation methods that are widely accepted

Virtually all innovative track planners have developed methods of student assessment which are uniquely suited to the innovative curriculum.

The new instruments usually assess skills utilized in such areas as clinical reasoning, problem-solving, interpersonal communication, and the quality of community-based educational experiences. These skills are more difficult to evaluate quantifiably than are the skills (primarily rote memory) usually evaluated by traditional, multiple-choice content examinations. Evaluations without “clean” numerical standards are often attacked by critics as being “soft” or “lacking in rigor”. As a consequence, the value of the innovative program itself is often demeaned. For this reason, virtually all innovative tracks have adopted some traditional student-assessment instruments in order to win general faculty approval, and to satisfy the demand for more familiar, quantifiable assessment by many of their students.

Examples: 1) The Shanghai program will administer newly developed, problem-solving examinations to students in both tracks at the end of each course. However, they will also administer the same basic-science content examinations to each group. Thus they will offer change while preserving some tradition.

2) In addition to extensive, innovative, process assessments, the New Mexico program gives a comprehensive, multiple choice examination to its students every six months in their first two years of medical school. This examination is very much like the Part I examination of the National Board of Medical Examiners, but in

this case it is used by the students as a self-assessment tool. The results do not form a part of the students' permanent records. However, the addition of this self-assessment tool has not only quelled the concerns of many traditional educators who feel comfortable only with hard numbers, but it has also calmed the nervous students in the innovative track who want to find out "what we really know".

Strategy 6: Describe the innovative track as an "experiment"

Experimentation in medical education elevates a merely "expected" faculty service (education) to the level of a loftier and more highly rewarded academic endeavor (research).

In most medical schools, faculty give education a lower priority than research, grant-writing, and other income-generating activities like patient-care and consultation. All of the latter are generally felt to count more toward academic promotion. Asking faculty to divert more time and resources to education, therefore, may meet resistance. Thus, it is important to frame the innovation in terms that are inherently appealing to a broad faculty audience, and to promote the innovation in terms that are consistent with their values and the existing reward system. Referring to the innovation as an "experiment" can be of help in this regard.

In addition, an experiment leads to results, analysis, and presentation for critical review. Faculty are more likely to support the innovation if they feel that they retain ultimate control over its continuation. A plan to review results of the track at a later date can satisfy this need for experimentation, review, and control.

Examples: In most institutions with innovative tracks, the faculty approved the educational experiment for a finite trial period after which evaluation data on the program would be reviewed. At Rush it will be evaluated after six years, and Thailand's MESRAP program will be evaluated after twelve. In other schools, evaluation of the track came about during the course of institutional review. The innovative and traditional tracks at the National Autonomous University of Mexico underwent a comprehensive evaluation during the innovative track's twelfth year, and all Philippine medical education programs underwent assessment of their effectiveness during the Palo, Leyte, track program's tenth year. At New Mexico and Harvard, faculty did not set a specific time for review, but such a review was explicit in the original approval of each track. Provision

for external review has encouraged the innovative-track planners to collect and analyze data about their programs, thus generating important educational research.

Evaluation

Strategy 1: Evaluate short-term results

It is important for planners of the innovative track to establish a set of questions that can be answered within one or two years about the feasibility and effectiveness of the program.

Administrators are likely to make decisions about the ultimate fate of the innovative track and its role in the larger institution, within a few short years. Such momentous decisions are likely to occur before the track has had an opportunity to graduate students and to demonstrate the fulfillment of its goals and the worthiness of its curriculum. Thus, the planners must become attuned to the important questions that the institution is asking about the program in the short run. This information can be used to decide when evaluation data should be obtained and presented in order to influence decision making. Virtually all of the data in these situations fall in the category of short-term results such as the following: “How do students in each track perform on comparable, standardized examinations?” “What is the cost and benefit of running two educational tracks in one institution?” “What is the effect on other aspects of academic productivity when the faculty’s teaching burden is increased?”

Example: In New Mexico, there was a perception among faculty and students in the traditional track, that students in the innovative track studied less and had an “easier time”. One evaluator quickly designed a five-day time/motion study during which a sample of students from each track kept logs of all their academic activities. The study demonstrated that while students in the innovative track spent less time in class, they spent more time studying on their own, and used a far greater variety of study resources, than did students in the traditional program. The data was presented to the faculty curriculum committee and the basic science liaison committee for internal dissemination. Criticism of this aspect of the program was soon quelled.

Strategy 2: Evaluate long-term results

Planners of the innovative track should establish a long-term evaluation team to design or select measures of how well the track fulfills its goals, and to describe the secondary and unforeseen effects of the track on the students and on the institution. The evaluation will require the collection of baseline data (for later comparison), periodic assessment of students, and both quantitative and qualitative measurements.

While establishing an innovative track, the attention of the planners is consumed by the day-to-day details of curriculum development, by program management, and by political skirmishes within the institution. Program evaluation is too often crowded out of the top priorities. In addition, the budget is rarely adequate to cover what planners feel is the reasonable expense of running a high-quality educational program. In this environment the additional funding required by an evaluation component will likewise take a lower priority. In some institutions with scarce resources, such funding may not exist at all. But the lack of a long-term evaluation plan, established from the track's inception, severely compromises the effect the track can later have both within the institution and upon the field of medical education.

Example: The National Autonomous University of Mexico designed a long-term evaluation of its innovative track. The evaluation was conducted over a 12-year period. Among other things, it compared graduate profiles and career decisions with student profiles at entry into medical school. It could therefore document which results could be attributed to the influence of the particular track. It was seen that the innovative track successfully influenced its students to select primary-care careers, which were most needed by Mexico. This carefully collected comparative data was critical in the university's decision, at the end of the 12 years, to 1) retain the track as its continuing experimental curriculum, and 2) to transfer aspects of the innovation into the entire traditional curriculum.

Strategy 3: Evaluate the "process" of change

It is important for program evaluators to document not only what changes occurred as a result of the innovative track, but how and why they occurred.

One of the most important contributions for the field of medical education made by innovative-track schools, concerns the process of change. These schools, therefore, have a unique opportunity to share with other educators a rigorous analysis of the change process itself—which strategies succeeded, which failed? The outcomes of the innovative tracks cannot be fully understood without a process analysis which explores such issues as the context in which change occurred, the forces which supported change, and the forces which opposed change.

Example: At New Mexico, since the inception of the innovative track, a medical sociologist has been retained as an external consultant to help evaluate the impact of the track on the institution—the process of institutional change. One important insight this type of evaluation fed back to track planners was that the Dean and many chairmen placed greater value on the prestige that the innovation brought to the institution, rather than on any particular “p-value” result comparing students in each track. This decreased the intense pressure on planners to conduct quantitative studies. It redirected attention toward the less quantifiable but more important outcomes of 1) disseminating change within the school, 2) increasing the track’s and school’s visibility within the state, and 3) having the faculty serve as consultants to other schools around the world. This enhanced the program’s image both within and outside the institution, and increased support of the program by the Dean and chairmen.

Networking

Strategy 1: establish linkages between institutions in developing and industrialized countries

It is important to develop institutional linkages between developing and industrialized countries. Refreshing insights emerge when health science institutions see how medical educators from very different backgrounds and cultures identify and solve pedagogic problems.

Innovative health science institutions in developing countries tend to have more fully developed community-based education programs than their counterparts in the industrialized countries. Conversely, innovative institutions in the industrialized countries often have better developed problem-based learning, and more advanced evaluation technologies. This situation presents an ideal opportunity

for international program collaboration and exchange. Each can profit from the other's more advanced expertise.

Example: A formal linkage between the National Autonomous University of Mexico's A-36 program and the University of New Mexico's PCC track was formulated by an official agreement of exchange signed by both deans. Subsequently, the programs exchanged educational techniques. A-36 used PCC's problem-based learning and their techniques for student assessment, while PCC revised and expanded its students' community-learning opportunities by developing elementary and secondary school-based clinics modeled on those used by A-36. Therefore, clear benefits accrued to both institutions.

Strategy 2: Develop linkages between similar, established institutions

It is important to develop linkages between similar, established institutions—one with, and one without, an innovative track. The transferability of innovation may be easier between schools whose environments, histories, and cultures resemble those of each other.

Medical educators often learn most from, and trust the experience of, fellow educators who have created innovations in institutions that are similar to their own, in terms of size, orientation, administrative structure, and political and social environments. Curricular resources and approaches, and political strategies for change, are often more easily transferable between such similar institutions.

Example: Michigan State University's Upper Peninsula program was one of the key models for the development of New Mexico's Primary Care Curriculum. Both schools were public institutions in large, rural states that were developing small, rural-oriented tracks, using a new educational technology—small-group, problem-based learning. New Mexico was able to adopt successful innovations which had been pioneered at Upper Peninsula; but with Upper Peninsula's advice, New Mexico was able to avoid several critical political and accreditation problems which Upper Peninsula had experienced.

Strategy 3: Develop a "sister school" relationship

Two schools can, over a long period of time, build a close, cooperative educational relationship. There can be an exchange of

faculty and trainees, an exchange of program ideas, and even a formal, signed declaration of cooperation between the administrative officers of the two schools.

Some of the most valuable consultations and interschool observations come over several years, after repeated visits by both faculty and students. Over time, each school more fully understands the focus for change, the personalities, and the value of innovations in the other school. Further, a relationship of trust develops which opens up more honest and productive channels of communication.

Example: The Shanghai Second Medical University and the University of New Mexico built a collaborative relationship over a four-year period, during which multiple exchange visits and hands-on workshops led to the Shanghai school developing China's first problem-based curricular track. The New Mexico school learned how to design a problem-based learning curriculum within traditional disciplines, preserving departmental administrative structure control over the innovation.

Strategy 4: Affiliate with a larger, recognized organization or network

A variety of national and regional health and education bodies can provide guidance and support to innovative programs.

Although many important, innovative ideas may be generated among a small group of faculty who may even have begun their own track, these faculty may be professionally isolated from other educational innovators. But without external recognition and support, their innovation is more vulnerable to extinction by isolation, exclusion, neglect, or active rejection by their established mother institution. Recognition of the importance of their work to the institution and to society can be enhanced when their efforts are publicly linked to a nationally or internationally recognized organization, or to a wider movement for change.

Example: The University of the Philippines Institute of Health Sciences program at Palo, Leyte, received needed national recognition and support only after the program was presented at several international forums, after its description was published in recognized international journals, and after it became a key participant in the WHO-supported Network of Community-Oriented Institutions for the Health Sciences.

Options for the future of the track

Strategy 1: Maintain the innovative track

A school might decide to retain the innovative track indefinitely as a “research and development” track. It would serve as a testing ground for new methods, while the more traditional curriculum would continue to evolve by adapting features of the innovative track.

The innovative track is also a vehicle for attracting external funding since it offers a ready-made laboratory for educational experimentation. Thus, the added cost of running two tracks is more than offset by the grant funds brought into the institution and the creative environment thereby introduced. Further, the existence of different tracks provides varied educational options for students with different learning styles.

Example: School-wide curriculum planners at the National Autonomous University of Mexico and at the University of New Mexico have decided that their institutions are best served by continuing an innovative, experimental track in the foreseeable future. In both cases the more traditional track has incorporated several important aspects of the innovative track. Thus, each institution now features two evolving tracks.

Strategy 2: Combine the two tracks into a hybrid

After a trial period, institutions can create a single, “hybrid” track by combining the best of the innovative and traditional tracks. Some institutions feel that the cost of running two tracks is prohibitive. Thus, after a trial period and evaluation of the innovative track, the best features of both tracks could be wedded into one hybrid curriculum. This would have the added advantage of averting competition between tracks and bringing the creative energy of those faculty formerly “sequestered” in the innovative track back into service for all students.

Example: Michigan State University is now considering a hybrid track due, primarily, to cost considerations. Its planned features strongly resemble the more innovative Track II.

Strategy 3: Convert the entire curriculum to the innovative method

After a trial period, the innovative track can demonstrate its worth and encourage a total conversion of the institution. When enough is known about what curricular changes need to take place, one should act on this knowledge and attempt to convert the entire curriculum to the content and methods employed by the innovative track. This would allow the institution to focus on a unified change rather than to continue with the uncertainty and higher cost of either endlessly fostering curricular change or running two tracks.

Example: While no innovative track has yet converted an established, traditional curriculum entirely to its innovative methods, some planners of Harvard Medical School's New Pathway support the notion of converting the entire curriculum to the New Pathway method.

Part II

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Comparison between innovative track schools: analysis of the questionnaires

This section presents a cross-comparison of various characteristics of the innovative tracks of the eight schools represented at the Albuquerque Conference. Each school submitted answers to an extensive questionnaire which was designed to provide critical information regarding the design, methodology, and development of each track. Analysis of the data was facilitated by grouping the information into seven broad categories:

1. Getting started
2. Curriculum
3. Overcoming resistance
4. Admissions
5. Personnel
6. Programme evaluation
7. Outcome

Summaries of the responses are presented according to these categories, together with brief elaborations. The questions and responses are presented in tabular form at the end of the chapter.

This section thus presents a series of approaches to the various steps in initiating and developing an innovative track. Some approaches have been embraced universally by the eight schools, while others have been suitable only to certain of the schools according to varied local circumstances. Common trends and contrasting approaches emerge from a careful examination of the responses.

Which strategies would be most suited to the reader's institution? A review of the opportunities and constraints existing at each of the eight schools in the conference will help the reader to make this determination.

Getting started

- Major motivations for change in every school were an excess of passive learning and a lack of curricular integration of basic and clinical science (Item 7).

Despite institutional orientation (whether toward research, tertiary care, primary care, or community health needs), each school strives to graduate a more active learner, a more scientific thinker. Therefore, integrated, student-centered, problem-based learning finds a broad supportive audience among medical educators.

- Five schools out of eight indicated that an additional major motivation for change was the scarcity of primary care physicians in their geographic areas (Items 7, 14).

Deficiencies in the delivery of health services and in the preparation of physicians for the tasks they are expected to perform in those services appear to be a primary concern of most public medical schools in developing countries and also in industrialized countries. This reflects the higher degree of accountability which is felt by state-run institutions toward the community. Private institutions have looser ties with the community and are more likely to make educational decisions on the basis of considerations within the institution.

- For six of the schools the track provided an opportunity to educate students also in the community (Item 13).

In established programs, curriculum time is already “spoken for”. The student’s day is overscheduled with lectures, laboratory exercises, or hospital assignments. In such an environment, even if one could insert a few hours of community-based instruction, the course would probably be offered only as an elective, and would have little impact on student attitudes toward patient care or career decisions. With an innovative track, on the other hand, planners can reorder curriculum priorities. Community health care needs, for example, can be given prime focus.

- Seven schools felt that one of the important benefits of a second track was that the students had a choice between curricular options (Item 12).

Different students prefer different learning methods. No one learning environment is appropriate for all learners. Thus, the addition of an innovative track gives each student the opportunity to choose, from two options, the learning method that is better tailored to his or her individual needs.

- Most participating schools required an average of two years from the initiation of planning to the admission of the first class (Item 1).

Two years seemed necessary to plan the program, generate institutional endorsement, obtain funding, select and train faculty, develop the curriculum, generate learning materials, and secure learning sites.

- Every school reported that the innovative track was shepherded into realization by a charismatic leader—usually the President, the Dean, or a key faculty member (Item 3).

Change of great magnitude in an established school requires a leader capable of taking risks—one who possesses powers of persuasion and a significant degree of self-confidence. These are essential qualities if one is successfully to challenge the status quo. Such a leader must have considerable charisma to rally support from a sufficient number of faculty and staff to provide adequate manpower for the innovation. These leadership skills must also be mobilized to protect the experiment and to blunt destructive criticism of the innovative track during its early, vulnerable years.

- All schools used the technique of small, multidisciplinary planning groups to develop their innovative tracks (Item 4).

Introducing a new curriculum requires a high degree of commitment from different constituencies within the medical school community. When representatives from these constituencies are drawn into a small planning group for the innovative track, each representative can help shape the program, thereby investing in its ultimate success. As a consequence, these representatives bring to their constituencies proxy ownership of the innovative track. This sense of ownership generates support.

- Initial funding for the new track came from external sources in five schools and from a reallocation of internal funds in three (Item 5, 6).

The establishment of an innovative track creates an added financial demand on the institution. However, the degree and source of funding for the innovations vary enormously from one institution to another. These differences may reflect variations in the degree of institutional commitment to the new idea, the existing resources of the institution, and the perceived usefulness of the innovative track in the achievement of institutional goals.

Curriculum

- Every school integrated basic and clinical science in preclinical years as a major feature of the innovative track. A hands-on, community experience was a frequent vehicle for this

integration. And for most schools, the problem-based format was of prime importance beginning, again, in the preclinical years (Item 40).

It is noteworthy that virtually all of the innovations are introduced to the students in the initial years of medical school. It is during the students' early, more "impressionable" years that planners of the innovative tracks feel that they can best establish an orientation toward program goals which will endure throughout the professional years.

- All of the innovative tracks employ tutorial groups. The tracks exhibit a wide variation in number of students per tutorial (5 to 25), number of tutorial meetings per week (2 to 5), and the length of time that each tutorial group stays together (5 weeks to 4 years) (Items 42, 44, 51, 52, 55).

Important learning criteria are the opportunities to reason and think, to be stimulated by the learning environment, and to build a close relationship with faculty role models.

- All five innovative tracks with a community emphasis introduced the community component of their curricula in their students' first year, and prepared their students for this experience with training in clinical skills. Students thus provided useful community service during their learning experience (Items 45, 46, 47).

While problem-based learning tends to rely on simulated clinical problems, community-based learning carries problem-based learning a step further. It places students in confrontation with real-life health problems, while providing them with sufficient professional tools to reinforce scientific learning with meaningful health care.

Overcoming resistance

Common sources of resistance

- The innovative track was perceived as an institutional threat by some faculty members in each of the schools. Common fears included a challenge to the departmental structure, an increased teaching load, and being asked to teach outside one's area of expertise (Items 19, 20, 21).

The benefit to track planners of being able to control their own innovation was often a double-edged sword. Such freedom

generated fear among traditional educators, fear of a curricular force which was outside the purview of established departments and committees. The smaller the number of track planners, the larger was the number of “excluded” faculty members subject to these fears of the unknown.

- All schools developed new student evaluation tools deemed more suitable for their innovative tracks. These included such approaches as problem-solving exercises and self- and peer-evaluation. These less traditional methods often met with disapproval by traditional faculty (Items 25, 75, 77, 78).

Traditional faculty members are usually more comfortable with evaluation instruments which produce easily quantifiable results like standard multiple-choice tests. “Rigor”, for these faculty members, is linked with that which is quantifiable; the more impressionistic and subjective the evaluation, the more it is characterized as “soft”. Behind such discomfort with newer evaluation approaches, lurks a fear of loss of control over the educational process itself. What and how you evaluate determines the shape of the curriculum and what students will come to value.

Common strategies to overcome resistance

- All schools found that a willingness to accept criticism, and to modify their innovative tracks accordingly, helped to build institutional support (Items 34, 35).

A willingness to compromise on all but principles is an essential strategy for overcoming resistance. Critics are honored by track planners when their input is considered seriously. Critics gain important ownership over the program when their ideas are incorporated into the new track. Such openness on the part of track planners also softens a common criticism of any small, enthusiastic group that promotes change in a traditional establishment—that they are arrogant or elitist.

- In seven schools, faculty members who teach in the innovative track teach also in the traditional one (Items 36, 38).

This dual teaching responsibility diminishes the potential for a destructive isolation of the two tracks, and facilitates a cross-fertilization of ideas. Furthermore, students in both tracks have access to the same educators, obviating an often-expressed fear

that the innovative track will deprive the traditional program of its best teachers.

- Most schools generated external financial support for their innovative track as a strategy to overcome local resistance. The support came from private funding agencies, the government, or from communities to be served by the track (Items 4, 5, 6, 27, 28, 29).

External support for the innovative track is a signal to the institution that the new idea has validity and a receptive audience beyond the small group of individuals promoting the track at home. When such external support is forthcoming, it also signifies the timeliness of the innovation.

- Four schools encouraged broad faculty participation in the innovation by channeling funds to individual medical school departments (Item 31).

The amount of the funds for participating departments is often small but it symbolizes recognition by track planners that they value educational efforts highly. This contrasts with a view held by many faculty that their educational efforts in the traditional system are not rewarded. In some cases the extra financial support helps departments cope better with budgetary constraints.

- All schools found that active involvement between faculty new to the innovation, and students in the innovative track, was a valuable recruiting tool (Items 36, 38).

Students in innovative tracks usually manifest an enthusiasm for learning and an interest in close relationships with their faculty. This is usually attractive to traditional educators who have become resigned to a social and professional distance between themselves and their students.

- In seven schools the track planners referred to their innovation as an “experiment” (Item 37).

This strategy is important. Medical “education” per se is felt by many faculty to be an obligation and a chore. Establishing the track as an “experiment,” however, elevates it to a more highly rewarded and valued faculty endeavor—research. It also implies that the innovation will be scientifically evaluated and that a decision on its ultimate fate will be determined on the basis of hard facts. Traditional faculty feel much happier with this approach.

Admissions

- Five schools accept applications to their innovative tracks only from students already admitted to medical school. Three schools, however, admit students from the applicant pool directly into their innovative track (Item 60).

Most innovative tracks find that by accepting applications only from students already admitted to medical school, they can avert the criticism that the innovation is “lowering standards” by accepting weaker students from the wide pool of applicants. Further, screening only already-admitted students for the innovative track allows more attention to be devoted to assessing each student’s degree of motivation, sense of responsibility, and adaptability. These are important ingredients for success in the new learning environments. Each of the three tracks that accept applicants directly was established to redress a severe shortage of physicians for a given geographical area. The students are recruited into the innovative track from that area and have either an explicit or implicit contract to return to practice medicine in that area upon graduation.

- The average age of students admitted to innovative tracks in United States schools is three to six years greater than that of students admitted to the traditional tracks (Item 61).

Students in the United States who volunteer for an educational experience that varies so greatly from the norm, and that incorporates so many features of adult learning theory, are likely to have had several years of independent, self-motivated life experience between graduation and entering medical school. They are more likely to have taken risks successfully and are therefore more willing to take a risk with an innovative medical curriculum in order to obtain a more meaningful education. They are less likely to be attracted to the regimentation of prescribed lectures and laboratories offering little room for self-direction.

Personnel

While all of the schools hired new support staff for their innovative tracks, only half hired new teaching staff (Items 66, 67).

- The budget of an educational institution is directly related to the number of employed personnel, especially the number of

teaching staff. The establishment of an innovative track does not necessarily require hiring more teachers. Existing teachers can be shared between the two tracks or detailed to teach in the new track. Fears that an innovative track will be too costly may thus be allayed.

- In most of the innovative tracks, tutors are drawn from both the clinical and basic sciences (Item 68).

The utilization of faculty from both disciplines facilitates meaningful integration of the sciences. It encourages cooperation in curriculum planning, and it fosters mutual learning. This helps to break down interdepartmental barriers—an important side effect of the multi-disciplinary approach.

- All innovative tracks have instituted faculty-development programs. These include workshops on the new educational principles and methods, and on-the-job supervision of new tutors (Item 69).

Educators who participate in the innovative track must, to some degree, be “reprogrammed” away from traditional teacher-oriented educational methods. For many faculty this is the first time they have ever been offered formal guidance in educational theory and skills.

- Seven schools select tutors who are not necessarily expert in the body of knowledge that students will study in the tutorial group (Item 71).

This is a reflection of the fact that a faculty member can facilitate learning by being an involved educator, and need not be a specialist in the area of medical knowledge under study. Utilizing this reality in the program may hasten the dissolution of interdepartmental barriers built on discipline-specific expertise. Track planners can focus on more relevant skills of educators, such as the ability to facilitate a tutorial group’s learning, or the ability to encourage students’ responsibility for their own learning.

- Most innovative tracks have devised rewards for faculty who participate in their programs. These rewards vary considerably among institutions—from increased monetary rewards, to more travel opportunities, to enhanced consideration for promotion, to faculty development (Item 72).

The thrust of activities of a faculty depends on what is valued in their institution. Rewards that are developed for faculty participation in the innovative track usually stand in stark

contrast to the dearth of rewards for traditional teaching. They invest education with a new value. Whether such a reward system can be sustained after the innovation becomes an established program, or whether such rewards can be slowly introduced for teaching activities in the traditional track, remains open to question.

Program evaluation

- Innovative tracks vary in the degree to which a program evaluation plan is in place. Some have established funded program evaluation teams from their inception, while others have mounted retrospective evaluations years later. Most of the schools can produce a demographic description of their student population and have the ability to compare academic performance between students in the innovative track and those in the traditional track. Half of the schools are assessing students' attitudes toward their education, and half are studying the impact of the innovative track on the institution (Items 75, 76, 79, 80, 84, 85).

Developing the evaluation technology to measure a broad array of program parameters is often costly and logistically difficult. When budgets are tight, program planners will understandably channel scarce funds toward basic program needs rather than toward program evaluation. Innovative-track programs, therefore, need easy access to inexpensive, easily adaptable program evaluation instruments. A consortium of schools sharing such tools and expertise would facilitate needed educational research on these important innovations. Task Force Seven on Program Evaluation of the Network of Community-Oriented Educational Institutions for the Health Sciences is one vehicle for facilitating such research.

Outcomes

Measures of long-term outcomes of the innovative tracks are not plentiful. Most programs have not existed long enough to have a sizeable number of graduates in practice. However, certain early outcomes are important and worthy of discussion.

- Career choice: The tracks in each of the four schools with sufficient data to assess career preference are all community oriented. It was found that more graduates from the innovative track chose careers in primary care or family medicine than did graduates from the traditional track (Item 86).

With few exceptions, students who choose the innovative tracks are self-selected. They may have been more inclined to select careers in primary care at entry. The support for primary care in the early, sustained, community-based experiences that are featured in these tracks is likely to reinforce that early interest. Further, these tracks usually offer their students community-based, primary-care physicians as role models. This experience gives legitimacy to a career different from those legitimated by the medical or surgical subspecialty role models predominating in traditional programs.

- Intellectual skills: Five schools collected comparative data on cognitive performance and/or problem-solving ability of students in both tracks. In three of the four schools with data on intellectual skills, these abilities were roughly the same in both tracks. In the fourth school, traditional track students performed better. In all three schools which assessed problem-solving ability, however, innovative track students performed better (Items 88, 89).

It is understandable that track students emphasizing problem-solving perform better in this skill. But it is surprising to many that students in the innovative tracks generally perform as well as their traditional-course peers on multiple-choice tests of memorized, scientific material. Perhaps they perform well because what they lack by not being presented with large volumes of isolated basic science facts, they make up for by contextual learning that has relevance and meaning.

- Faculty attitudes: Four of five schools collecting such data found that faculty attitudes toward the track improved after personal participation in the innovation. In the other school, faculty attitudes remained the same (Item 91).

Experience is the best teacher. One of the best ways of recruiting faculty to the innovation is to offer them practical experience with the new method, particularly if they can deal directly with the students.

- Influence of the innovative track on the traditional track: Four schools report that their traditional tracks are now using more

small-group discussions, and five schools report an increase in the use of problem-based learning in their traditional tracks (Item 92, 93).

Perhaps the most important outcome of the innovative track experiments to date is the degree to which they have influenced traditional education in their institutions. This is a consequence of several factors: the high visibility of the new programs, the attention they pay to building institutional and external support, and the cross-fertilization of ideas that is made possible when a traditional and innovative track run in parallel in the same institution.

- Influence of the traditional track on the innovative track: Five schools indicate that their innovative tracks have been significantly influenced by their traditional ones. All five reported an increase in the numbers of organized lectures and laboratory sessions in the innovative tracks. And in three of these schools there has been an increase in the use of objective assessment techniques in evaluating their students (Items 97, 99).

Innovative track planners usually set out to influence traditional medical education. But to some extent, the innovation becomes modified by the established, host institution. It is well to reflect on the fact that the innovator's zeal too easily dismisses too much of tradition that may be of value and strategically, it is important to remember that no innovation can survive without compromise and accommodation.

Table 1. Answers to the questionnaire submitted by the eight schools

	Mexico- UNAM	Michigan State – Upper Peninsula	University Philippines	Bangkok- MESRAP	New Mexico	Rush	Harvard	Shanghai
Getting started								
<i>A. General data</i>								
1. Year track began	1972	1972	1974	1976	1977	1982	1984	1984
Year students entered	1974	1974	1976	1978	1979	1984	1985	1986
2. Population of								
Med school city	18 million	130,000	6 million	5 million	350,000	7 million	3.5 million	12 million
Track city	18 million	15,000	9,000(Palo)	120,000	350,000	7 million	3.5 million	12 million
3. Track began with and promoted by:								
Charismatic leader	X	X		X	X	X	X	X
Pres/Vice-President			X	X			X	X
Dean	X	X		X		X	X	X
Chairman/Faculty					X			X
Students				X				
Community		X						
4. Key early activities to build support								
Multidisciplinary, small planning groups		X		X	X	X	X	X
Admin. support	X	X	X	X	X	X	X	X
5. External funding initially		X	X	X	X		X	
6. Internal funding reallocation	X			X		X	X	
<i>B. Rationale, motivation, incentives for change by track</i>								

7. Motivations for change in general								
Too few primary care physicians	X	X		X	X			
Learning too passive	X	X		X	X	X	X	X
Lack of integration in basic, clinical sciences	X	X		X	X	X	X	X
8. Track bypasses dept. control	X	X		X	X	X	X	
9. Innov. track for volunteers on ethical approach to change	X	X		X	X	X	X	X
10. Small track minimally threatening		X		X	X	X	X	X
11. Track offers an experimental design		X	X		X	X	X	X
12. Track increases curricular options	X	X		X	X	X	X	X
13. Track offers new approach for community-based education	X	X		X	X			
<i>C. Forces supporting change</i>								
14. 3 most important forces supporting change								
1.	national mandate	more rural MD's	univ. leadership	MD shortage	legislative mandate	desire to improve education	dean	MDs meet future
2.	dean support	admin support	national interest in primary care	physician maldist.	physician maldist.	opportune time	separation of tracks	government mandate
3.	community needs	legislative support	rural manpower needs	inadequate rural care	external funding	dedicated faculty	money	university initiative

Comparison between innovative track schools

Table 1 (*continued*)

	Mexico- UNAM	Michigan State – Upper Peninsula	University Philippines	Bangkok- MESRAP	New Mexico	Rush	Harvard	Shanghai
15. External mandate (national, state, legislative body, WHO, etc.)	X	X		X		X	X	X
16. Institution's desire to lead reform	X	X		X		X	X	
17. Desire for national, international acclaim	X			X	X	X		
18. Having strong link with other schools	X			X	X	X	X	X
<i>D. Forces resisting change</i>								
19. Perceived threat to established structure					X	X	X	X
20. Faculty fear of increased workload		X		X	X	X	X	X
21. Faculty concern re teaching outside of area of expertise		X		X	X		X	X
22. Faculty loss of control		X		X	X		X	X
23. Faculty fear of reduced chance of promotion					X		X	X
24. Fear of conflict				X	X		X	
25. Institutional discord over evaluation	X	X	X	X	X	X	X	X
26. Concern re making changes too rapidly	X		X	X				X

E. *Strategies to overcome barriers to change*

27. Develop broad-based support			X	X	X	X	X	X
28. Obtain government financial support	X	X	X					X
29. Develop community support		X	X	X	X			
30. Recruit influential faculty			X	X	X		X	
31. Provide part of extra funding to departments			X	X	X		X	
32. Use community physicians as clinical faculty		X	X	X		X		
33. Develop faculty advisory group		X	X	X	X	X	X	X
34. Be willing to compromise	X	X		X	X	X	X	X
35. Be willing to incorporate criticism	X	X	X	X	X	X	X	X
36. Have traditional faculty work with students in innovative curriculum	X	X	X	X	X	X	X	X
37. Have innovative track described as an "experiment"	X	X	X		X	X	X	X
38. Use same faculty to teach in both tracks	X		X	X	X	X	X	X
39. Develop a newsletter		X		X	X	X		X
Curriculum								
40. Years encompassed by track	1,2,3,4	1,2,3,4	1,2,3,4,5	1,2,3,4,5,6	1,2	1,2	1,2,3,4	1,2
41. Area of emphasis of innovation								
Primary care	X	X	X	X	X			
Problem-based learning	X	X	X	X	X	X	X	X
Community-oriented	X	X	X	X	X			

Comparison between innovative track schools

Table 1 (continued)

	Mexico- UNAM	Michigan State – Upper Peninsula	University Philippines	Bangkok- MESRAP	New Mexico	Rush	Harvard	Shanghai
Integrated learning Other	X tutorial	X rural	X	X	X student- centered	X	X	X
42. Location of track								
At medical school	X	X		X	X	X	X	X
In community	X	X	X	X	X			
43. How curriculum term is divided								
Independent study	0%	50%	–	34%	50%	30%	50%	40%
Small-group discussion	80%	10%	variable	3%	40%	50%	10%	50%
Lecture/lab	20%	5%	variable	43%	0%	10%	11%	
Other	–	35%	–	20%	10%	10%	26%	10%
44. Curriculum organized								
By department				X				X
In an integrated fashion	X		X		X	X	X	
45. Principal learning methods								
Problem-based curriculum	X	X	X	X	X	X	X	
Small-group learning	X	X	X	X	X	X	X	X
Peer teaching	X	X		X	X		X	
Lecture format	X	X	X	X		X	X	X
Community-based experiences	X	X	X	X	X			X
46. Students learn clinical skills during first year	X	X	X		X	X	X	X
47. Patient care first year								
Hosp. inpatient	X		X		X		X	
Hosp. ambulatory							X	
Community-based	X		X		X		X	

48. Community experience during first year	X		X	X	X			X
49. Curriculum time spent in the community	20%	50%	35%	No data	24%	0%	0%	9%
50. Clinical work								
Hosp. inpatient	40%	—	55%	74%	63%	80%	80%	33%
Hosp. ambulatory	40%	—	0%	8%	5%	18%	15%	67%
Community-based	20%	—	45%	18%	32%	2%	5%	0%
51. Students are allowed to transfer between tracks		X	X		X	X		X
52. Number of students/tutorial	20–25	6	10	8–16	5	6	6–8	8–15
53. Number of tutorial meetings/week	5	2	2	5	2.5	2	3	3
54. Average duration of each tutorial meeting (hrs)	4	2	3	2	3.5	2	2	3
55. Tutor time/week (hrs)	20	4	5	10	9.5	4	6	no data
56. Each tutorial group stays together	40 wks	4 yrs	11 wks	5 wks	8 wks	12 wks	8–12 wks	no data
57. Students involved in curriculum planning	X	X			X	X	X	
Admissions								
58. Number of students/year								
Traditional track	1,140	70	—*	100	53	300	125	620
Innovative track	140	6 (of 35) [†]	60	50	20	36	40	30
59. Number of students admitted to innovative track								
Initially	280	10	13	10	10	12	24	30
1986	140	6	26	50	20	36	40	
Future projection		6	26	50	20	30		

* The University of the Philippines has two, administratively, distinct medical schools. One, traditional, is in Manila, while the smaller, innovative one is on the island of Leyte, which we refer to here as a "track."

[†] Of 106 medical students admitted to Michigan State University each year, about 35 choose the innovative problem-based curriculum. Of those, 6 are chosen to later enter the Upper Peninsula Programme.

Table 1 (*continued*)

	Mexico- UNAM	Michigan State – Upper Peninsula	University Philippines	Bangkok- MESRAP	New Mexico	Rush	Harvard	Shanghai
60. Students are admitted to the track								
Directly		X	X	X				
After admission	X		no data		X	X	X	X
% applicants admitted to track					35%	10%	60%	
61. Average student age on admission								
Innovative track	18	28	17	18	28	26	23	18
Traditional track	18	22	21	18	25	22	23	18
62. Male:female ratio								
Innovative track	1:1	1:1	1:2	3:1	1:1	1:1	3:2	1:1
Traditional track	1:1	1:1	no data	3:1	2:1	3:2	3:2	1:1
63. Selection into track								
Assigned	X							
Volunteer		X	X	X	X	X	X	X
Random	X		no data		X		X	
"Pick the best"		X	no data			X		
Special recruitment			no data	X				
64. Selection criteria								
Intelligence		X		X	X	X		X
Small-group skills		X		X	X	X		
Maturity		X		X	X	X		
Rural interest		X	X	X	X			
Rural background		X	X	X	X			

Personnel

65. Innovative track reports to:	Faculty	Dean, Dept of Fam. Med.	no data	Univ. Program Comm.	Dean Steering Curr. Comm.	Dean	Acad. Dean Curriculum Committee	President
66. New teaching staff were hired for the innovative track	X	X		X				
67. New support staff were hired for the innovative track	X	X		X	X	X	X	X
68. Track tutors are: Basic science faculty Clinical science faculty Both	X				X	X	X	X
69. Programmes offered to participants in innovative track								
Faculty development					X	X	X	X
Education workshops	X			X	X	X	X	X
Faculty/student video				X		X	X	X
Educational support services			X		X	X	X	X
70. Tutors								
Assigned by dept.					X			X
Selected by innovative- track staff	X			X	X	X	X	X
Volunteers				X	X	X	X	X
Mandatory				X				
71. Tutors must be curriculum experts								X
72. Faculty rewards								
More money				X	X	X	X	X
Travel						X		
Promotion				X	X			X
Development of new educational skills				X	X	X	X	

Comparison between innovative track schools

Table 1 (*continued*)

	Mexico- UNAM	Michigan State – Upper Peninsula	University Philippines	Bangkok- MESRAP	New Mexico	Rush	Harvard	Shanghai
73. Number of medical students (per year) in school	1,140	106	no data	100	73	120	165	650
74. Number of medical students (per year) in innovative track	140 (13%)	6 (6%)	60 (100%)	50 (50%)	20 (27%)	18 (15%)	40 (24%)	30 (5%)
Evaluation								
75. Track has developed its own curriculum assessment	X	X	X	X	X	X	X	X
76. There is a monitoring body for both tracks	X	X		X	X	X	X	X
77. New assessment tools	X	X	X	X	X	X	X	X
78. Self and peer assessment done	X	X	X		X	X		
79. Both tracks have same exams developed within institution				X		X		X
80. Both tracks have same exams administered by outside body	X	X	X		X	X	X	X
81. Track students take multiple- choice tests	X	X	X					
82. What % of assessments are “objective” tests	50%	90%	50%	75%	0%	5%	35%	no data
83. Student assessment								
By department			no data					X
Interdisciplinary		X			X	X	X	
Both		X		X			X	

84. Features of program evaluation								
Mechanism for evaluating entire program in place				X	X	X	X	X
Evaluation is separately funded				X	X		X	
Evaluations give program frequent feedback				X	X	X	X	X
Program evaluates both tracks					X	X		X
85. Aspects of programs studied								
Social, demographic status of students	complete	no plan	complete	current	complete	current	current	current
Student attitudes toward education	no plan	no plan	planned	current	complete	current	current	current
Self-assessment by students	complete	current	planned	current	planned	current	no plan	current
Career choices, practice location	complete	current	planned	planned	complete	current	no plan	no plan
Academic performance in each track	complete	current	current	current	complete	current	planned	current
Teaching staff attitudes	no plan	current	current	current	current	current	planned	current
Institutional change	complete	no plan	planned	current	complete	planned	no plan	no plan
Track outcomes (Relative to traditional track)								
86. Track career choice								
Primary care, family practice	more	more	more	no data	more	no data	no data	no data
Rural/underserved	no data	no data	more	no data	no data	no data	no data	no data
87. Positive attitudes toward learning								
88. Cognitive skills	no data	same	no data	less	same	same	no data	no data
89. Problem solving	no data	more	more	more	no data	no data	no data	no data
90. Lifelong learning	no data	more	no data	no data	no data	no data	no data	no data

Table 1 (continued)

	Mexico- UNAM	Michigan State – Upper Peninsula	University Philippines	Bangkok- MESRAP	New Mexico	Rush	Harvard	Shanghai	Innovative Tracks
91. Improved teaching staff attitudes	no data	no data	more	no data	more	same	more	more	
Influence of innovative on traditional track									
92. Small-group learning	increase	no data	no data	increase	increase	no data	increase	no data	
93. Problem-based learning	increase	no data	no data	increase	increase	increase	increase	no data	
94. Primary care, community experiences	increase	no data	no data	increase	no data	no data	no data	no data	
95. Varied student assessment	increase	increase	no data	increase	increase	no data	no data	no data	
Influence of traditional on innovative track									
96. Teaching staff control of curriculum		increase		increase	increase		increase	no data	
97. Use of objective assessment		increase		increase	increase		no data	no data	
98. Unstructured student time				decrease			no data	no data	
99. Organized lectures and labs	increase	increase			increase	increase	increase		
Future									
100. Continuing external funding required		X		X				X	
101. Future plans									
Whole school like new track				X					
Blending of tracks		X	X			undecided	X		
2 tracks – "as is"						undecided			
2 tracks – both evolving	X				X	undecided			