

Basic Training Program in Medical Pedagogy: a 1-year program for medical faculty

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In 1979 université de Montréal developed the Basic Training Program in Medical Pedagogy; the program has since been offered at two other Canadian medical schools. The learning activities are spread over an academic year so that the teachers are able to continue their clinical or research duties. The program, which follows a model of systematic instruction, comprises 17 self-instructional modules on basic educational topics adapted to medical teaching. The topics are related to four components of an integrated system: student needs and learning objectives, instructional methods, student evaluation and program evaluation. The instructional format is aimed at three levels — understanding, analysis and application — to which assignments and assessments are related. In addition to the modules, the program offers 15 half-day sessions for small groups (five participants and one instructor) to discuss aspects of the program, especially home assignments and the application of personal educational projects. A minimum of 100 hours of personal time is requested. The program's main goal is that students be placed at the centre of the educational process. Of 215 participants since 1979, 171 (80%) have completed the program and reported high satisfaction. Issues related to any faculty development program are discussed.

Depuis 1979 la Faculté de médecine de l'université de Montréal offre un programme de formation en pédagogie médicale, également mis en place par la suite à deux autres facultés de médecine canadiennes. Les activités d'apprentissage sont étalées sur une année académique, de sorte que le professeur n'ait pas à laisser ses tâches de recherches ou de clinique. Le programme d'instruction systématique comprend 17 modules d'auto-formation adaptés à l'enseignement de la médecine et traités sous quatre rubriques formant un système intégré: besoins et objectifs, méthodes d'apprentissage, évaluation de l'étudiant, évaluation du programme. L'apprentissage se fait en trois temps: compréhension, analyse et application, auxquels sont reliés exercices et évaluations. Au cours de 15 rencontres d'une demi-journée en petits groupes, on discute des devoirs des élèves et de l'application des principes à l'enseignement de chacun. Il doit y consacrer un minimum de 100 heures de travail personnel. Le but est de placer l'étudiant au centre du processus d'apprentissage. Jusqu'à maintenant, parmi 215 participants depuis 1979, 171 professeurs (80%) ayant suivi le programme complet ont exprimé un taux élevé de satisfaction. Les auteurs discutent des questions inhérentes à tout programme de formation en pédagogie médicale.

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For many years medical education and politics were regarded as the only two professions that did not require formal training. In most North American medical schools faculty members are hired for their clinical or research skills, although it is teaching that distinguishes them from other clinicians and researchers. Most medical faculty members have never received specific training as teachers, despite the many years it took them to become clinicians or researchers.¹⁻³

Times have changed for medical teachers, if not for politicians. Medical knowledge has progressed so far that it is no longer possible for students to learn everything on all subjects. It has become obvious that students have to learn how to learn. As computers compete with the lecture hall for the transmission of information, it is necessary for teachers to understand the learning process as well as teaching procedures. Cognitive psychology has given us greater insight into learning, and medical teachers have expressed the need for more training in pedagogy.³⁻⁵

Normally two paths are available to faculty members who wish to improve their pedagogic knowledge and skills: workshops offered by the office of educational development at their school or university or a leave of absence for formal training in medical education, often outside their university. In a survey of Canadian medical schools sabbaticals and workshops ranked first and second in a list of the 10 most effective faculty development practices.⁶

The 1-year Basic Training Program in Medical Pedagogy is a third path available to faculty members, who would not have to leave their present clinical or research duties. The program was constructed on the assumption that every university teacher should learn educational principles to become more competent and efficient in helping students learn medicine.

Most of us develop expertise in a rather limited field of medicine. We usually consider teaching as the art of transmitting to students specific knowledge or skills in our chosen field and are asked to give lectures on particular subjects. Teaching is discussed and measured by the number of hours allotted to disciplines or systems. However, it is obvious that many other dimensions are involved in the teaching-learning interaction.

Faculty members at universit  de Montr al expressed the need to become more knowledgeable in the teaching-learning process. To meet that need the Basic Training Program in Medical Pedagogy was developed by us in 1979 when Unit  de recherche et de d veloppement en  ducation m dicale (URDEM) was being established. The program was later offered at universit  de Sherbrooke and the University of Ottawa.

Goals

The program is aimed at changing traditional attitudes toward teaching and learning so that participants place more emphasis on the student who learns than on the teacher who teaches. The efficient teacher is one who is able to help students learn. More precisely, the program encourages participants to learn the scientific bases of medical education, to master the knowledge and skills of teaching and learning and to apply the newly acquired knowledge and skills to their daily teaching activities.

Content

The basic concepts in medical education are presented under 17 topics (Table 1) and organized according to a model of systematic instruction derived from the one proposed by Guilbert (Fig. 1).⁷ The model considers each element of a learning activity to be part of a system in which all components are interrelated.

The introductory session reviews the four components of the systematic instruction model: student needs and learning objectives, instructional methods, student evaluation and program evaluation. These four components are first discussed in general terms, with an emphasis on the student as a learner and the learning environment as playing a major role in any educational change.

Participants begin by studying students' needs, which represent the gap that exists between the students' actual competence and the competence they should have after the learning activities. The assessment is centred on the competencies required

Table 1: Topics covered in the Basic Training Program in Medical Pedagogy

Designing of instructional activities
Needs and objectives
Assessment of educational needs
Establishment of objectives
Instructional methods
Selection
Small-group discussion
Self-instructional modules
Teaching in the classroom
Problem-based learning
Workshops
Clinical supervision
Teaching in the laboratory
Evaluation
Planning of student evaluation
Testing of knowledge
Measurement of psychomotor skills and attitudes
Program evaluation
Student learning process and environment
Facilitation of student learning
Implementation of change

by the students to accomplish their future professional tasks.⁸ The various professional activities are analysed and subdivided into specific tasks. Cognitive, psychomotor and attitudinal components of these tasks are then transformed into learning objectives.

The converting of needs into educational objectives is accomplished through an approach derived from Knowles.⁹ Goals, general objectives and specific objectives are considered. As suggested by Mager,¹⁰ specific objectives are defined in terms of observable behaviour (i.e., what the student will be able to do once the learning activities have been completed).

After the principles that govern the selection of instructional methods are established, participants are exposed to methods that are the most widely used in medical curricula and that usually favour interactive student learning: small-group teaching, self-instructional modules, lectures, problem-based learning, workshops, clinical supervision and teaching in the laboratory.

The next step in the systematic instruction model is student evaluation. The proper measuring instrument is chosen, mainly on the basis of the domains (knowledge, psychomotor skills and attitudes) and the levels of learning objectives. The instrument must be valid, reliable, usable and practicable. Results from this evaluation are good indicators of the efficiency of instructional methods and thus permit readjustment if necessary.

Program evaluation is considered only after the learning activity has been in progress for a certain time. Critical examination of all aspects of the educational activity provides feedback on the practicality and realism of the objectives and could lead to major changes in the program design or even to its replacement.

To complement the four components of the systematic instruction model, participants are given

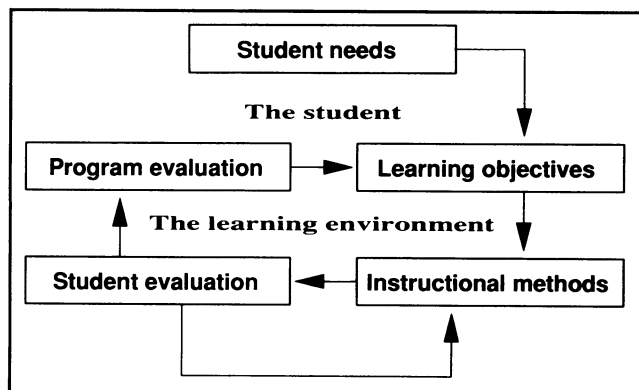


Fig. 1: Model of systematic instruction, interrelating student needs, learning objectives, instructional methods and evaluation. Model takes into account student learning process and environment.

the opportunity to improve their understanding of the fundamentals of student motivation and the factors facilitating educational change. The latter presents a theoretical framework for the successful implementation of educational innovation. Participants have to discuss their personal project as a case of educational change in a specific milieu.

Instructional format

The program involves two learning methods: self-instruction and small-group discussion. Since lectures are not part of the program instructors act as resource people and, when necessary, as discussion leaders.

Self-instruction through a series of modules is convenient to the participants, whose already overburdened schedule calls for a flexible and self-sufficient approach. Furthermore, the "input-practice-feedback" approach used in the modules, as described later, respects most of the conditions for efficient learning in the cognitive domain.¹¹

Small-group discussion is also an effective learning strategy in the cognitive domain. Peer interaction not only is repetitive and therefore reinforcing but also teaches through the discussion of personal experiences. These factors are key to long-term memory retention and easy retrieval of information.¹² Small-group discussion is also effective in meeting objectives in the affective domain.¹¹ Interaction among participants and the presence of the instructor as a role model play an important part in reaching the first goal of the program — to place the student at the centre of the educational process.

We have developed a series of 17 self-instructional modules, one for each topic covered by the program.* The modules are constructed according to a three-step learning format: understanding, analysis and application (Fig. 2). Each step is described with the second module, "Assessing educational needs", as an example.

Understanding

In the first step participants acquire basic learning and teaching concepts related to the topic, which are presented as reading material and a series of short exercises using the input-practice-feedback pattern — a case (input) about which the participants must answer questions in writing (practice) is followed by a detailed written report (feedback) for self-evaluation. For example, Dr. D, an allergist, is

*Copies of the modules are available in French from URDEM, Médecine-Direction, Faculté de médecine, université de Montréal, CP 6128, Succ. A, Montréal, PQ H3C 3J7. An English version is in preparation.

asked to organize a 1-day continuing medical education session for 40 general practitioners. The reader becomes aware of basic educational concepts by first writing answers to a series of short questions and then referring to the model for solutions.

Analysis

The participants are then asked to solve a series of fictional cases using the newly acquired concepts. The input-practice-feedback model is used again. For example, the first case in the second module is as follows:

The head nurse of the intensive care unit of a regional hospital consults you as a health sciences educator. She wants to organize a training program in intensive care for her nurses. Until now nurses arriving in her unit from other departments had to learn on the job. The head nurse, the administration, as well as the nurses themselves, feel that this training is insufficient. How would you proceed in assessing the educational needs in this situation?

After addressing the problem in writing the participant reads solutions offered by the authors.

Application

After using the basic concepts learned in step 1 to solve problems in step 2, participants are asked to apply their newly acquired knowledge to their own teaching activities. During the first session of the program participants define the educational project that they will develop step by step during the year. For example, in the second module on needs assessment the home assignment reads as follows:

Establish your strategy to assess educational needs of the population to which your teaching project is aimed. Clearly identify and give a brief description of each step of the procedure. By reading your work, one of your colleagues should be able to proceed with the needs assessment without any further information.

One participant, who was dissatisfied with her lectures on the physiopathology of aging, chose to restructure her teaching as her project. She realized after reading the chapter on needs assessment that she knew very little about the prior knowledge of her students and what would be expected from them when they entered clerkship. For her home assignment she drew up a detailed plan to get information from such people as the students, the other teachers whom the students had had both before and after her course and the assistant dean of education.

Small groups of five participants led by one instructor attend 15 half-day sessions to discuss home assignments and the applications to personal educational projects; this enables the teachers to learn how to receive and give educational feedback. In addition, the group members review the basic concepts of and solutions to the fictional cases. Participants learn from each other and have the opportunity to assess whether they have mastered the basic concepts. Because the personal projects and problems differ the participants become aware of the diversity of the teaching environment in their school. On a rotating basis participants are asked to lead the group discussion to improve their teaching skills. On some topics participants become even more active; for instance, they give a "microlecture" and experience problem-based learning in a small group by analysing and solving a nonmedical problem.

At universit  de Montr al, in addition to the 15 regular sessions the groups get together three or four times a year for a 1-day plenary session during which the participants study one aspect of the program in depth. During one such session the participants developed their own measurement tools to evaluate the program.

Each of the three steps is mastered by different learning activities and then evaluated by an appropriate measurement tool in accordance with sound educational principles.

Participants

Over the last 9 years 133 faculty members from universit  de Montr al have voluntarily registered in the program (Table 2). In 1984 the dean of medicine at universit  de Sherbrooke asked us to implement the same program for his faculty; to date, 77 faculty members have enrolled in the program. In 1987-88

COMPONENTS OF LEARNING PROCESS			
Levels of learning	Objectives	Activities	Evaluation
1	Understanding Acquisition of knowledge	Reading text Answering questions	Model answers
2	Analysis Solving	Working on fictional cases	Decoding cases
3	Application of knowledge	Developing personal project	Peer critics Field testing

Fig. 2: Levels of learning and components of learning process. Each module comprises three parts that correspond to three levels of learning. At the highest level, participants apply their newly acquired knowledge to a personal educational project.

the program was taught to five faculty members at the University of Ottawa. Of the 215 people who have enrolled since 1979, 171 (80%) have completed the course. If the basic sciences teachers, who represented about 4% of the participants, are excluded the 20% attrition rate does not vary significantly over the years between disciplines or universities. The participants who drop out of the course usually do so early on, mainly because they are unable to spare enough time for the home assignments.

Few teachers from basic sciences departments have taken the course (Table 3). Jason and Westberg⁵ reported a similar trend in other North American medical schools. Over the years faculty members from the basic sciences departments have apparently developed their own teaching strategies and thus do not feel a need for such a program. On the other hand, faculty members from the departments of Family Medicine accounted for most of the participants. At universit  de Montr al a newly developed graduate program in family medicine and the need for educational development expressed by the new staff might have accounted for the interest in the program.

Outcomes

Are teachers more competent after participation in the program? Are they capable of applying the appropriate knowledge, skills and attitudes they were supposed to have mastered? Will they translate competence into performance? The effects of faculty development programs are difficult to measure since so many variables are involved, a situation somewhat similar to the one encountered in the evaluation of the effectiveness of continuing medical edu-

cation.¹³ However, we have tried to evaluate the participants and the program.

Although in any program evaluation the easiest and least appropriate approach is to assess the degree of participant satisfaction, we ask participants to answer an evaluation questionnaire at the end of the program. The degree of satisfaction has remained high. Participants have felt that they learned a great deal and are more confident about their teaching abilities. They have also stated that the perception of their role as teachers has changed. The program has made them more conscious of their teaching strategy by structuring their intuitive knowledge of teaching and learning into a systematic approach.

Direct observation of the participants' performance during the program seems to confirm their self-analysis. The instructors, who monitor the progress, have observed an obvious change in attitude toward teaching and learning and in the participants' ability to criticize and discuss constructively the educational projects of their colleagues.

Involvement in pedagogy and in educational projects might reflect a change in attitude, one of the aims of the program. Indeed, the program has created interest in medical education in Montreal and Sherbrooke: 15 former participants decided to continue their education in pedagogy by attending a series of 1-day sessions on new pedagogic topics; 9 others became instructors in the program. Many participants have also become active members and leaders of the Club de p dagogie m dicale du Qu bec.¹⁴

A more objective way to measure program effectiveness than determining participant satisfaction is to conduct comprehensive tests before and after the course to demonstrate that the teachers

Table 2: Number of participants in the program from 1979 to 1989 in three Canadian medical schools*

University	Year; no. of participants									Total
	1979-80	1980-81	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	
Montreal	9	22	19	17	15	18	8	10	15	133
Sherbrooke	-	-	-	-	14	19	19	14	11	77
Ottawa	-	-	-	-	-	-	-	5	0	5
Total	9	22	19	17	29	37	27	29	26	215

*Program not offered in 1981-82.

Table 3: Departmental affiliation of participants

University	Basic sciences	Medicine	Surgery	Family medicine	Other	Total
Montreal	2	26	17	30	58	133
Sherbrooke	7	18	10	10	32	77
Ottawa	0	2	1	1	1	5
Total	9	46	28	41	91	215

have gained new knowledge and can apply it. The preliminary results of such an evaluation of one group of participants have been positive; however, they must be confirmed through further measurement.

Discussion

After supervising instructors for 4 years, conducting the same educational program for 9 years in three schools at different stages of curriculum changes, using different practice plans and enrolling faculty members from various departments, we gained some insight into faculty development in pedagogy and became aware of issues related to these programs.

To educate is to invite people to change.⁹ To change attitudes and behaviours takes time, thought and deep personal involvement. Specific knowledge and skills may be acquired in workshops or short courses. However, to develop an attitude that places the student at the centre of the educational activities is a long process, at least for teachers who have lectured for many years and who may be influenced by an educational milieu emphasizing the transfer of information. Our 1-year course gives participants the time to initiate such a change in attitude.

Since the program is voluntary we are uncertain whether the faculty members who registered were those who needed the course the most. Almost all of the participants were already deeply interested in teaching, which might be considered a prerequisite for such an intensive involvement. Although most of the participants in Montreal were either part-time or voluntary teachers, practically all of the ones in Sherbrooke were geographic full-time faculty members. However, the two groups seemed to react and behave in a similar fashion. All of the participants enthusiastically accepted devoting more than 100 hours of their time in addition to their regular academic duties. This dedication to teaching creates a sense of solidarity and commitment in the group toward fostering educational changes.

Educational jargon and "soft-sciences" thinking may create difficulties for participants with biomedical backgrounds. Thus, our self-instructional modules explain the basic educational concepts in simple terms and use practical examples in which the educational terminology is limited but the essential basic concepts are not neglected. Furthermore, simulated cases taken from the biomedical teaching environment allow participants to apply their knowledge and to attain higher learning objectives. Systematic feedback from the participants, the instructors and three external educational experts have improved the self-instructional modules, which are now in their final edition.

The participants who acted as instructors under our guidance could also use the modules efficiently with their peers and supervise the small-group sessions. Although the modules are intended as self-instructional tools the presence of a faculty development coordinator responsible for the program and dedicated instructors seems to be essential. Through commitment, enthusiasm and mastery of the concepts, the coordinator plays the role of a mentor in a learning experience in which attitudes are certainly as important as knowledge.

The design of our program is in accordance with most of the principles of adult education.⁹ All examples, exercises and case studies are taken from the daily lives of the participants. These people are asked to apply the newly acquired knowledge and skills to their own teaching activities. The new principles are immediately applicable and useful to the participants' teaching and pedagogic activities. Furthermore, participants learn mainly through discussion and exchange with their peers; this creates not only a lively and enjoyable climate but a learning reservoir of peer experiences. When asked which aspect of the program facilitated their learning process the most the participants stressed the exchanges with their colleagues.

At the end of any educational process one presumably has changed. Indeed, the instructors have observed in many participants a stronger commitment to pedagogy and a more positive attitude toward educational changes. For instance, teachers in Sherbrooke who had successfully completed the program had no difficulty in playing a significant role in the implementation of the new student-centred and community-oriented curriculum.¹⁵

Conclusion

With their teaching, research and clinical duties, medical teachers have relatively little time to devote to personal development in pedagogy. Those who feel a strong need to improve their skills appreciate a comprehensive program in pedagogy that is structured, practical and adapted to their needs and activities in medical education. An adequate balance between self-instruction and small-group learning allows our program to attain its goals, the main one being that teachers focus their attention on the students' needs rather than on their own performance as teachers. Participants view the teacher-student interaction as a systematic process involving various strategies to influence student learning more effectively and to initiate instructional innovations. Teachers have the opportunity to experience self-evaluation and can master fundamental principles of education without leaving their clinical or research duties. A number of participants have invested their

learning in improving the courses and developing new educational activities.

We thank Dr. Paul Grand'Maison, who headed the program at universit  de Sherbrooke for 4 years.

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Conferences

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June 24-29, 1990: 3rd International Conference on Emergency Medicine (hosted by the Canadian Association of Emergency Physicians, in association with the American College of Emergency Physicians, the Australian College for Emergency Medicine and the Casualty Surgeons Association of Great Britain)
Royal York Hotel, Toronto
Continuing Education, Faculty of Medicine, University of Toronto, Medical Sciences Building, Toronto, Ont. M5S 1A8; (416) 978-2718

June 25-29, 1990: Canadian Public Health Association 81st Annual Conference (hosted by the Ontario Public Health Association)
Harbour Castle Westin, Toronto
Canadian Public Health Association, 400-1565 Carling Ave., Ottawa, Ont. K1Z 8R1, (613) 725-3769, FAX (613) 725-9826; or Ontario Public Health Association, 202-468 Queen St. E, Toronto, Ont. M5A 1T7, (416) 367-3313, FAX (416) 367-2844

June 28-30, 1990: 25th Meeting of the Canadian Congress of Neurological Sciences
Banff Springs Hotel, Banff, Alta.
Permanent Secretariat, Canadian Congress of Neurological Sciences, PO Box 4220, St. C, Calgary, Alta. T2T 5N1; (403) 229-9544

July 18-21, 1990: Genetics Society of America 59th Annual Meeting (cohosted by the Genetics Society of Canada)
San Francisco Hilton
Administrative Office, Genetics Society of America, 9650 Rockville Pike, Bethesda, MD 20814; (301) 571-1825

Aug. 10-13, 1990: 6th International Conference on Pharmacoepidemiology
Anaheim Marriott Hotel, Anaheim, Calif.
Dr. Stanley A. Edlavitch, Department of Epidemiology and Biostatistics, McGill University, 1020 Pine Ave. W, Montreal, PQ H3A 1A2; (514) 398-8983, FAX (514) 398-4503

Aug. 27-29, 1990: Canadian Health Economics Research Association 4th Conference: Restructuring the Health Services System — How Do We Get There from Here?
University of Toronto
Gail Thompson, conference coordinator, Institute of Health Management, University of Toronto, 12 Queen's Park Cres. W, Toronto, Ont. M5S 1A8, (416) 978-8384, FAX (416) 978-7350; or Dr. Raisa Deber, conference chair, Department of Health Administration, University of Toronto, (416) 978-8366

Sept. 13-15, 1990: New Brunswick Medical Society Annual General Meeting
Hotel Beaus jour, Moncton
Ms. Judy Orem, annual general meeting coordinator, New Brunswick Medical Society, 176 York St., Fredericton, NB E3B 3N8; (506) 458-8860

Sept. 14-16, 1990: Canadian Hospital Association 7th Annual Invitational Seminar on Health Care Directives
Millcroft Inn, Alton, Ont.
Conferences, Canadian Hospital Association, 100-17 York St., Ottawa, Ont. K1N 9J6; (613) 238-8005, FAX (613) 238-6924

Sept. 15-23, 1990: British Medical Association Annual Scientific Meeting
Edinburgh
Meetings Department, PO Box 8650, Ottawa, Ont. K1G 0G8; 1-800-267-9703; FAX (613) 731-9013

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