

PROBLEM-BASED LEARNING AT THE RIBEIRÃO PRETO FACULTY OF MEDICINE? WEIGHING THE PROS AND CONS

*APRENDIZADO BASEADO EM PROBLEMAS NA FACULDADE DE MEDICINA DE RIBEIRÃO PRETO?
ESTIMANDO OS FATORES FAVORÁVEIS E OS CONTRÁRIOS*

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ABSTRACT: The potential advantages and drawbacks of introduction of problem-based learning (PBL) to the medical curriculum at the Ribeirão Preto Faculty of Medicine are analyzed, considering such aspects as student maturity faculty burdens physical plant adaptations information retrieval infrastructure and expectations of graduates The author concludes that constraints derive from the work and cost involved in altering ease of information retrieval training faculty and preparing written patient problems If these constraints were met students might benefit from such a curricular adaptation. The hypothesis could be tested by introducing PBL into specified segments of the curriculum and carefully monitoring the results.

UNITERMS: Faculty Medical. Learning. Education, Medical.

Medical school curricula utilizing problem based learning are currently operating from Nigeria to the Netherlands, from small schools emphasizing primary care, such as Southern Illinois University (SIU) School of Medicine, to Harvard¹. These curricula have replaced traditional courses and classroom formats with integrated learning based on written and standardized patient problems. Students are not told what to memorize on a day-to-day basis by professors who are the sources of medical information. Rather the students themselves formulate and address their own learning needs, guided by trained tutors who supervise their learning on a meta-cognitive level and formally assess the development of their knowledge, clinical reasoning skills, self-directed learning, and interpersonal skills.

Recently I had the privilege of participating as a master-tutor in the Workshop “Metodologia de Ensino em Pequenos Grupos e Problem-Based Learning”

(ROT-719) at the Faculdade de Medicina de Ribeirão Preto (FMRP). Like most medical schools FMRP is actively concerned with evaluation² of innovations in medical education adequate student assessment³, curricular reform⁴ and integration of new ideas within the Brazilian experience⁵ naturally, during the workshop many questions arose as to the feasibility and/or desirability of introducing PBL in the curriculum at FMRP. The issues could be grouped into those related to the questions, **could** PBL be used at FMRP and **should** PBL be used at FMRP? I summarize some of those issues here and give my own personal conclusions as to the potential role of PBL in medical education at FMRP.

Could PBL be used at FMRP?

Are the students at FMRP mature enough to perform well in a PBL setting? The PBL curriculum depends on self-discipline rather than

Structured assignment of specific tasks to guide study. Learning is not monitored by frequent quizzes or multiple-choice tests. In Brazil, students enter medical school directly from high school and thus are younger and less experienced than American medical students. They might not be up to the challenges of such an unstructured environment. However several facts make me confident that the students could successfully meet PBL requirements. First, Brazilian medical students are exceptionally bright and motivated. The rigors of passing the entrance requirements, more stringent and selective than those in the USA, assure this. Second, the PBL format, with its constant tutor-student contact, permits ongoing assessment and guidance of each individual student's progress. This interaction is much more frequent and direct than faculty-student contact in traditional curricula and begins on the very first day of school. Such monitoring would do much to prevent the immature student from being "lost in the crowd" or left to struggle or fail without support or advice.

Would introduction of PBL overburden present faculty or necessitate hiring new teachers? PBL students work in groups of six, led by a tutor. Tutors can be assigned to a "block" of the curriculum, i.e. a set of patient problems relevant to a given organ system such as "Gastrointestinal/Endocrine/Reproductive" or "Psychiatry/Neurology/Musculoskeletal". At SIU School of Medicine, students complete ten such blocks, each lasting roughly two months, in the first two (preclinical) years of medical school. Thus, the format requires participation of about five tutors per six students per year. Each tutor participates during about two months of the academic year. Since tutoring involves guidance at the meta-cognitive level, tutors need not prepare lectures, slides, hand-outs, quizzes, etc. Tutoring sessions (usually less than three hours long) are held at the convenience of the group and tutor, two or three times per week. Between sessions, the students study the learning issues identified for the case, examine related anatomical material, or consult experts by appointment; the tutor has no other assignments. Tutors need not be experts in the area being covered, since they are not a direct source of information; at SIU, tutors include medical doctors, non-physician clinical faculty, and basic science professors. Since the format is radically different from that of traditional teaching activities, prospective tutors need to be trained in PBL methods and assessment, which can be done on site within a Workshop such as

that recently held at FMRP. As is evident from this description, introduction of PBL has little chance of introducing an onerous extra burden to faculty duties or requiring the hiring of additional or specialized teachers.

Would it be expensive to adapt the physical plant for PBL? The answer to this is a simple no. PBL tutor sessions can take place in any room large enough to accommodate seven people in a "round table" seating arrangement and having a blackboard, flipchart, or other means of writing for all to see. I have attended successful PBL sessions in hotel rooms, regular classrooms, labs, libraries, convention centers, and clinics. At SIU School of Medicine, each group of six PBL students has its own tutorial room, which contains the listed amenities, as well as a medical dictionary and anatomical charts. The students consider the room to be their home-base and also use it for individual and group study sessions. It can also be transformed into an "exam" room by putting a pad on the table; students can then examine simulated patients who illustrate the cases under study. The room also contains a computer terminal linked to the school network, but this is not used directly in tutorial activities. Students need no other classrooms. They have free access to the regular student anatomy labs and pathology materials, making appointments for supervision as needed. One aspect of the layout which must be considered is geographical ease of access to learning resources such as the library, since the students are free to identify any and all sources of information relevant to the learning issue they are pursuing.

Would the current information retrieval system available at FMRP impede the progress of PBL students? Independent, efficient retrieval of up-to-date, relevant information is one of the skills central to PBL. This means students do not rely solely on medical textbooks, but supplement textual information with journal articles, software and interactive teaching tools and online sources of additional data. Like all medical schools, FMRP's ability to provide students and faculty with the latest information is limited by budget constraints and the ever-growing cost of books, journals, retrieval services, and computer ware. These innovations appear with such frequency that faculty and students may find it hard to keep abreast of the technical aspects of access; and traditional curricula make fewer demands that students be adept in independent retrieval, beyond awareness of the latest edition or translation of

standard medical texts. Trainees in the recent workshop pointed to limitations in retrieval services as a potential problem in establishing PBL. I agree; the problem seemed to center on identifying relevant source material, rather than absence of such material in the library. For example, having identified “jaundice” as a learning issue and given 24 hours to find relevant information, no postgraduate level workshop participant identified a pertinent, succinct review which appeared recently in **Medicina, Ribeirão Preto**, a journal originating on campus. Students had epidemiological information on cholecystic disease in the USA (mentioned in a text), but had no specific information (which could be located in Brazilian journals by consulting Medline©) about the disease in Brazil, nor did they mention that a group on campus carries out basic research on cholestasis⁷. I do not fault the participants. They were conscientious in searching for material and even complained that they lacked enough time to prepare properly (which demonstrates the seductive effectiveness of the PBL method, since the Workshop was on teaching methods, not the biliary system.) I concluded that successful implementation of PBL would require that students have more convenient access to retrieval services such as Medline©, as well as becoming more attuned to using retrieval resources such as *Index Medicus Latino-Americano* and accessing the national literature to provide truly relevant information. I would contend, however, that this necessity is not unique to use of a PBL teaching format. The exponential rate of increase in medical information and technological advancement demands that regardless of how they are taught, students and practicing physicians must be able to keep abreast of information without relying on hard bound medical texts. This is especially true when texts describe the practice of medicine within a different culture, society, genetic poor epidemiological situation, or when an additional time lag for translation makes the information even more out-of-date. Thus the impetus for improving the system at FMRP comes not from introduction of PBL but from the future requirements of adequate teaching of medicine in general.

Should PBL be used at FMRP?

What are the essential expectations of a practicing physician graduate of FMRP? Barrows⁸ recently described two core expectations of physician behavior, i.e. that they **a)** manage their patients’ health problems in an effective, efficient and humane manner;

and **b)** continue learning throughout their professional lives to meet the often unique and changing needs of patients, the changing problems and demands of the health care system, and to keep contemporary in medical knowledge and practice. Descriptions of the evolution of medical education at FMRP and elsewhere in Brazil^{2,4,5} are consistent with the view that in Brazil these are also core expectations and that modifications to improve education target such aspects of these objectives as improved critical reasoning, self directed learning, and socially appropriate attitudes and no cognitive behaviors, as well as cognitive knowledge.

Would PBL-trained physicians from FMRP fulfill these expectations as well as do current graduates? *Primum non nocere*. Any contemplated curricular changes should have some assurance of doing no harm to students and, additionally, of significantly improving at least some aspect of their education. Most physicians and educators trained by traditional methods are uneasy with the apparent “lack of structure” in PBL, so different from their own educational experiences. They mainly fear that the system will result in significant gaps in the students’ data bases. However, meta-analysis of results from 19 institutions using PBL⁹ has shown that students trained by PBL and those trained by traditional methods did not differ significantly in miscellaneous tests of factual or clinical knowledge. PBL was found to be significantly superior with respect to students’ attitudes and opinions about their programs and measures of students’ clinical performance. The authors state, “the comparative value of PBL is also supported by data on outcomes that have been studied less frequently, i.e., faculty attitudes, student mood, class attendance, academic process variables, and measures of humanism.”⁹ Participants of the workshop at FMRP, in their written commentaries of the method, uniformly remarked on the motivating features of PBL. They also agreed that with adequate infrastructure, the method could produce physicians who were “lifelong learners”, trained to efficiently update their knowledge throughout their careers.

My own conclusion, based on available data, is that introduction of PBL could enhance some aspects of education at FMRP, without doing significant harm. However, these data are not complete, and it would certainly be presumptuous of a visitor to make sweeping statements about what would be “good for the school” after a one-week visit. One way to test the hypothesis of the benefits of PBL would be to

introduce it into specified segments of the curriculum and monitor the results. Current didactic experiences in which small groups of students could have frequent contact with a faculty member over several weeks would provide an ideal setting for adaptation to PBL, involving primarily the preparation of teaching problems based on relevant cases and training of the faculty as tutors. Crucial to the success of such an endeavor,

however, would be the prior formulation of explicit objectives for the experience, as well as clearly delineated methods to measure whether the objectives had been achieved. In many cases, attempts to establish educational innovations may be unsuccessful, not because the experiment was a failure but because its obvious success had not been explicitly documented.

MORIEARTY PL. Aprendizado baseado em problemas na Faculdade de Medicina de Ribeirão Preto? estimando os fatores favoráveis e os contrários. **Medicina, Ribeirão Preto**, 29: 403-406, out./dec. 1996.

RESUMO: As vantagens potenciais e os possíveis inconvenientes da introdução do Método de Aprendizado Baseado em Problemas ao currículo do Curso Médico da Faculdade de Medicina de Ribeirão Preto são analisados levando em consideração diferentes aspectos como a maturidade dos estudantes, a sobrecarga ao corpo docente, a necessidade de adaptações da área física, a infra-estrutura de obtenção de informações bibliográficas e as expectativas dos graduandos. A autora conclui que as principais dificuldades estão ligadas ao esforço e ao custo despendidos em modificar as facilidades relacionadas à obtenção de informações, ao treinamento de docentes e ao preparo de problemas escritos, envolvendo situações de pacientes. Se estas dificuldades forem superadas, os estudantes poderiam auferir benefícios desta adaptação curricular. Esta hipótese poderia ser testada por meio da introdução do Método de Aprendizado Baseado em Problemas em segmentos específicos do currículo, seguida do cuidadoso acompanhamento dos resultados.

UNITERMOS: Aprendizado - Faculdade de Medicina. Educação Médica.

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