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WEB PAPER

Revival of the case method: a way to retain student-centred learning in a post-PBL era

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Abstract

Background: In current renewal of medical education, problem-based learning (PBL) is the predominant approach. PBL is afflicted with limitations, which cause uncertainty about its future. A profoundly different approach is the case method, developed a century ago and today attracting much less interest in developmental work than PBL.

Aim: To compare the characteristics of PBL and the case method and ask the question of whether the case method may serve as an alternative approach to student-centred learning.

Method: The comparison was literature-based.

Results: PBL implicates fostering of self-directed learning and its prospects deal with depth and retention of knowledge and clinical reasoning skills. Problems are used to define learning goals and to stimulate students' interest in various aspects of an item, rather than just for problem-solving. In the small-group tutorials of a PBL curriculum, the teacher is assigned to facilitate the process of self-directed learning and needs not necessarily be a subject-matter expert. In spite of its exciting philosophy and an increased input of students' and teachers' time, the superiority of PBL as a mode of learning has not been convincingly demonstrated, either in terms of acquisition of knowledge or in clinical performance. Moreover, dysfunction is a well-recognized phenomenon. In some PBL tutorials, indifference towards the group discussion is encountered, including individual quietness or dominant behaviour and incomplete attendance. To cope with dysfunctional problems, efforts are recommended aiming to increase PBL tutors' and students' understanding of the group process. As opposed to PBL, the case method relies strongly on teacher-directed learning. Students are placed in a dilemma or a problem to be solved. After preparatory work, they meet for a discussion, lead by a subject-matter expert, who preferably has experienced the case in reality. As a chairperson, the teacher is supposed to stimulate the discussion and detect gaps and misunderstandings. Due to its teacher-dependent approach to learning, the case method is less susceptible to group dysfunction. The case method is also less resource consuming, primarily because it can be practised in groups several times larger than those of PBL.

Conclusion: A revival of the case method seems warranted as an alternative means of interactive learning, which is simpler, easier to realize and less time-consuming with regard to both institutions and students.

Introduction

Since its introduction in the 1970s, problem-based learning (PBL) has been the predominant model in renewal of medical education (Neufeld & Barrows 1974). The case method (or case discussion method), a discrete approach to interactive group-based learning, was already introduced a century ago within economics and the faculty of law (Barnes et al. 1994). In more recent developmental work on undergraduate medical education, the case method has attracted only limited interest (Engelberg 1992; Thomas 1993; Tärnvik 2002; Marantz et al. 2003; Smith et al. 2004).

Limitations of PBL make both its advocates and its sceptics uncertain about the future of the approach. Here the case method will be argued to overcome these limitations, yet offer a curiosity-increasing and student-centred approach to medical education.

Practice points

- The aim of the case method, i.e. to gain familiarity with knowledge already acquired by teacher-directed learning, is simpler and easier to realize than that of PBL, i.e. to learn by self-generation of knowledge under the supervision of a process facilitator.
- Due to a more teacher-dependent approach to learning, the case method is less susceptible to group dysfunction, a well-recognized problem inherent in the PBL group.
- The case method is less resource consuming, primarily because it can be practised in groups several times larger than those of the PBL tutorial.

Table 1. Characteristics of PBL and case method.

Feature	PBL	Case method
Principle	Student-directed generation of knowledge	Teacher-directed problem solving, increase of familiarity
Strategy	Clarify text, define learning goals, achieve factual knowledge, compile	Receive text, prepare individually to suggest solutions, discuss in large group, reach agreement
Sources	Library (IT), interviews, few lectures	Course material, books, feasible number of lectures
Group size	5–7 (–8)	15–30 (–60)
Expertise primarily needed	Process expertise	Subject-matter expertise
Facilitation	Observe and give advice on process, save for cover of syllabus	Chair, catalyze discussion, detect gaps and misunderstanding

Strategy of PBL and the case method

In the PBL tutorial, the work proceeds via a series of steps (Table 1), initiated by brief presentation of a biomedical phenomenon or clinical situation that requires explanation. The students formulate their learning goals, leave to carry out an individual search for knowledge and meet again for discussion and compilation. By these self-directed efforts, the group integrates scientific and clinical aspects of an item.

In contrast to PBL, studies performed according to the case method are based on problems to be solved (see Table 1). The narrative presented should evoke interest by placing the students in a dilemma, taken from a real-life example. The text may be more or less extensive, and should include those details that were important when the case occurred. The text is written from the perspective of a key person, who has to take decisions or declare a standpoint, and with whom the student should identify. Various aspects are handled (science, ethics, law etc.) and the case should be open to alternative solutions. When preparing for a case discussion, students may utilize knowledge already obtained from lectures and other sources. They prepare individually or in small groups and meet for a discussion, led by a teacher.

In essence, PBL stimulates students to explore the knowledge needed to understand a given phenomenon, whereas the case method offers opportunities for familiarization and deepening of knowledge already acquired through lectures and other sources. It should be noted that both approaches emphasize depth of understanding, in PBL promoted by self-generation of knowledge and in the case method by an expert-led group discussion.

The teacher's role in PBL and the case method

The assignments of the tutor of a PBL group differ completely from those of the facilitator of a discussion within the case method (see Table 1). Among PBL authorities, there is some dispute regarding the need for subject-matter expert knowledge. Although in a practical guide to PBL the best tutor is

argued to be the subject-matter expert who has the appropriate group facilitation skills, only the latter skill was regarded as mandatory (Davis & Harden 1999). This is a consequence of the philosophy behind PBL, i.e. acquisition of knowledge as a matter of self-generation. In such a context, a willingness of the tutor to provide subject-matter information may be controversial. The teacher is assigned to promote the development of scientific reasoning, self-study and self-evaluation. This includes encouraging, reinforcing, shaping and hinting (Neufeld & Barrows 1974).

In contrast to PBL, the case method involves expert-chaired group discussions (see Table 1). Besides subject-matter expertise, valuable skills are those required for effective chairing of a committee meeting, including allocation of time, promotion of interaction among participants and visual observation of the auditorium for detection of withheld comments or questions. The subject-matter expertise of the teacher is required to catch misunderstandings and knowledge gaps and to explain what happened when the case occurred in reality.

In practical terms, the chairman of a case-method session remains leader of a knowledge discussion whereas in a PBL tutorial the facilitator observes progress and guides the tutorial group through its process of self-study.

Limitations of PBL

PBL's philosophy is grounded in cognitive psychology, citing curiosity as a main driving force for learning. Curiosity is evoked by presenting students with a scenario or a phenomenon that needs clarification. Self-directed learning in small groups is thought to enhance the depth and retention of knowledge. Despite its attractive philosophy, the superiority of PBL as a mode of learning has not been convincingly demonstrated. This is a matter of concern, due to the cost associated with its implementation and also because of widely varying attitudes towards PBL among faculty and students. In 2000, a careful re-evaluation of several major PBL studies was undertaken, thereby initiating a more critical discussion of the approach (Colliver 2000). Colliver found no substantial evidence favouring PBL in relation to traditional learning, either in terms of acquisition of knowledge or in

Table 2. Responsibility for generation of knowledge by PBL or the case method.

PBL		Case method
Faculty	Construct curriculum, formulate syllabus	Faculty
Student*	Formulate specific learning goals	Teacher
	Acquire/deliver factual knowledge	
	Explain factual knowledge	
	Compile information	Student
	Familiarize	
	Reach deeper understanding	

*Teacher responsible for facilitation of learning process and cover of syllabus.

clinical performance. When differences were demonstrated, they were small. Moreover, doubt was raised regarding the relevance of the differences, due to a biased sex and age distribution among the groups compared and also because students had been allowed to choose between the two approaches when admitted to medical school. Also in continuing medical education there is limited evidence that PBL is superior to other educational strategies in increasing participants' knowledge and performance (Smits et al. 2002).

When PBL was introduced in Sherbrooke, Canada, the teaching time increased during the first 2.5 years of curriculum from 1645 hours of lecture to 5364 hours in PBL groups plus one hour of lectures per week. After adjustment for preparation time, the implementation of PBL was estimated to result in a 30% increase in scheduled teachers' time (Des Marchais 1991; Des Marchais et al. 1992). In various models of PBL, the cost of additional resources needs to be considered. The curriculum may offer a free amount of teachers' time for students' individual consultation (Mifflin et al. 2000) and an extensive amount of time may be needed to plan, organize and execute integration of basic science principles in the appropriate clinical context (Dahle et al. 2002). Moreover, PBL involves increased cost for rooms used for small-group activities.

Institutional resources represent only one part of the increased cost of education in a PBL curriculum. The other concerns students' efforts. Obviously, self-generation of knowledge, the fundamental principle of PBL, is associated with an increased need for students' time (Table 2).

Besides the increase in costs, reports suggest that the implementation of PBL may be associated with frustration among students and faculty (Berkson 1993; Hendry et al. 2003; Dornan et al. 2005a). Although PBL is enjoyed by students and PBL students feel more confident than non-PBL students with their clinical performance (Albanese & Michell 1993; Vernon & Blake 1993), the dysfunctional PBL group is nonetheless a well recognized phenomenon (Hitchcock & Anderson 1997; De Grave et al. 2001; Hendry et al. 2003). One important dysfunction, namely ritual behaviour, involves indifference towards the group discussion and/or a failure to prepare or attend regularly. To overcome dysfunctional behaviours, intensified education of facilitators is suggested

(Dolmans et al. 2001), in an effort to stimulate group discussion and to help the students perform formative peer-directed evaluations. The prospects for such interventions are unknown.

Also among faculty, there is justified apprehension (Williams & Lau 2004). According to a recent study, the extension of a PBL curriculum from the basic to the clinical stage led to a feeling among staff of lost opportunities to mediate experience-based knowledge (Dornan et al. 2005a). The experience was reported also by those teachers who had been selected for the task because of their positive attitudes towards PBL.

Limitations of the case method

A major limitation of the case method is the difficulty in constructing cases. In preclinical education, the quality of a narrative may decide whether a case will arouse interest or not (Barnes et al. 1994; Herreid 1997; Erskine et al. 1998). The case should have a real background, irritate or trigger a willingness to discuss, and concomitantly fulfil a scheduled learning objective. In preclinical courses, situations applicable to an item may not be easily found and cases cannot be expected to cover a whole syllabus. In the clinical environment, construction of cases is much easier. Since students' assignments are supposed to mimic problems encountered in daily work, narratives can be derived from clinical records. Nonetheless, there are prerequisites to consider. The case should preferably be taken from the teacher's own duties, to allow for information on additional details and final outcome. Moreover, the clinical case should not be too complicated or special, and should be open to alternative solutions.

Another limitation of the approach is a need for teachers capable of chairing case sessions. Teaching skills include ability to listen, catch signals in the classroom and make students talk to each other (Tärnvik 2002). A varying willingness among faculty to participate over time has been reported (Marantz et al. 2003). According to the experience of the authors, the method 'requires a substantial preparation time, and can be draining'. Faculty development, retraining and supervision are required (Marantz et al. 2003). It was

recalled by the authors that the Harvard Business School requires regular peer observation, evaluation and feedback, and offers a 'Discussion Leadership Seminar' over 10 weeks.

Concluding remarks

Reliance on self-directed vs. teacher-directed learning remains the most obvious difference between PBL and the case method (see Table 1). According to a recent description of PBL group dysfunction, the lack of subject-matter expertise at the beginning of each new phase of a PBL curriculum is a serious problem (Mifflin et al. 2000). Brainstorming to raise ideas on learning goals, as practised in the PBL tutorial, may require knowledge more substantial than can be instantly and spontaneously produced by the students knowledge. As remarked by Eva in a critical comment on the value of teamwork (Eva 2002), brainstorming by a group has been shown to be less effective as a way of creating ideas than individual brainstorming (Pinsonneault et al. 1999). From a study based on interviews of clinical teachers, the authors concluded that self-direction as a method of learning was 'inapplicable to basic professional education in the clinical environment' (Dornan et al. 2005b).

A comment regarding 'self-direction' should be added here. According to the PBL approach, the term 'self-directed' refers to the individual student. As remarked previously (Schmidt 2000), however, PBL does not at all imply individual direction. In fact, 'group-directed' or 'student group-directed' would be a more precise term. A failure to recognize this distinction may be a contributory factor to the difficulty in foreseeing dysfunction in the PBL group. The PBL approach takes for granted that all members of a tutorial group will agree with what the majority agree is a priority. The lack of alternative means of learning may be a reason for frustration, eventually leading to escape from the group and fight for survival by rote learning (Mifflin et al. 1999, 2000). The case method is less tightly restricted and less predominant in the curriculum, allowing students to choose more freely among theoretical learning events, including lectures and material produced by faculty.

In contrast to the PBL approach, the case method is compatible with teacher-directed delivery of factual knowledge. By relieving students of decisions on learning goals and a search for factual knowledge, more time can be allocated for familiarization and deepening of knowledge in case discussion. Ethics, genus, law and human relationships are aspects that may be integrated by the students in the context of simulated situations. Such integration is supposed to be favourably assisted by a subject-matter expert and preferably by a tutor who has experienced the situation in daily work.

In preclinical education, construction of cases is a difficult assignment. Guidance for writing narratives and adapting various formats of case studies for science education, and examples of cases with accompanying instructions for the teacher, are available from the National Centre for Case Study Teaching at the University of Buffalo, State University of New York (<http://buffalo.edu/libraries/projects/cases>). Due to the workload associated with the construction of cases (Marantz et al. 2003), re-utilization is recommended. In the

present author's experience (Tärnvik 2002), no marks should be given during case sessions. As a consequence, a willingness to disclose gaps and lack of understanding is encouraged. On this premise, cheating becomes meaningless and cases can be re-utilized as long as they are still appropriate, thus saving tutors' time.

Medical faculty are under increasing pressure to accomplish scientific achievements, and efficiency in educational duties is a prerequisite for capability to compete. In interactive learning, the group size is a determinant of efficiency. By allowing relatively large groups of students, the case method keeps teachers' scheduled time at a reasonable level, well adapted to that allocated for traditional lecture-based curricula. The most convenient way to introduce the case method would be to gradually increase the number of case sessions from one running of a course to the next, thereby adapting the endeavour to the resources available and taking advantage of experience continuously acquired, including students' evaluations. By adopting such a housekeeping strategy, there may be room for a suggested selection of teachers trained to chair case discussion (Marantz et al. 2003).

In essence, PBL and the case method are based on two profoundly different approaches to interactive learning. Despite extensive developmental work during recent decades, the superiority of small-group directed learning according to the PBL approach has not been convincingly demonstrated. A revival of the case method seems warranted as an alternative means of interactive learning, which is simpler, easier to realize and less time-consuming with regard to both institutions and students.

Notes on contributor

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References

- Albanese MA, Mitchell S. 1993. Problem-based learning: a review of literature on its outcomes and implementation issues. *Acad Med* 68:52–81.
- Barnes LB, Christensen CR, Hansen AB. 1994. *Teaching and the Case Method* (Boston, MA, Harvard Business School Press).
- Berkson L. 1993. Problem-based learning: have the expectations been met? *Acad Med* 68:S79–S88.
- Colliver JA. 2000. Effectiveness of problem-based learning curricula: research and theory. *Acad Med* 75:259–266.
- Dahle L, Brynhildsen J, Behrbohm Fallsberg M, Rundquist I, Hammar M. 2002. Pros and cons of vertical integration between clinical medicine and basic science within a problem-based undergraduate medical curriculum: examples and experiences from Linköping, Sweden. *Med Teach* 24:280–285.
- Davis MH, Harden RM. 1999. AMEE medical education guide no 15: Problem-based learning: a practical guide. *Med Teach* 21:130–140.
- De Grave WS, Dolmans DHJM, Van Der Vleuten CPM. 2001. Student perceptions about the occurrence of critical incidents in tutorial groups. *Med Teach* 23:49–54.
- Des Marchais JE, Bureau MA, Dumais B, Pigeons G. 1992. From traditional to problem-based learning: a case report of complete curriculum reform. *Med Edu* 26:190–199.
- Des Marchais JE. 1991. From traditional to problem-based curriculum: how the switch was made at Sherbrooke, Canada. *Lancet* 388:234–237.

- Dolmans HDJM, Wolfhagen IHAP, Van Der Vleuten CPM, Wijnen WHFW. 2001. Solving problems with group work in problem-based learning: hold to the philosophy. *Med Edu* 35:884–889.
- Dorman T, Hadfield J, Brown M, Boshuizen H, Scherpbier A. 2005a. How can medical students learn in a self-directed way in the clinical environment? Design-based research. *Med Edu* 39:356–364.
- Dorman T, Scherpbier A, King N, Boshuizen H. 2005b. Clinical teachers and problem-based learning: a phenomenological study. *Med Edu* 39:163–170.
- Engelberg J. 1992. Complex medical case histories as portals to medical practice and integrative, scientific thought. *Am J Physiol* 263:S45–S54.
- Erskine J, Leenders MR, Maufette-Leenders LA. 1998. *Teaching with Cases* (Ontario, Canada, Richard Ivey School of Business, The University of Western Ontario).
- Eva KW. 2002. Teamwork during education: the whole is not always greater than the sum of the parts. *Med Edu* 36:314–316.
- Hendry GD, Ryan G, Harris J. 2003. Group problems in problem-based learning. *Med Teach* 25:609–616.
- Herreid CF. 1997. What makes a good case? Some basic rules of good storytelling help teachers generate students' excitement in the classroom. *J College Sci Teach* December 1997/January 1998: 163–165.
- Hitchcock MA, Anderson AS. 1997. Dealing with dysfunctional tutorial groups. *Teach Learn Med* 9:19–24.
- Marantz PR, Burton W, Steiner-Grossman P. 2003. Using the case-discussion method to teach epidemiology and biostatistics. *Acad Med* 78:365–371.
- Mifflin BM, Campbell CB, Price DA. 1999. A lesson from the introduction of a problem-based, graduate entry course: the effects of different views of self-direction. *Med Edu* 33:801–807.
- Mifflin BM, Campbell CB, Price DA. 2000. A conceptual framework to guide the development of self-directed, lifelong learning in problem-based medical curricula. *Med Edu* 34:299–306.
- Neufeld VR, Barrows HS. 1974. The 'McMaster philosophy': an approach to medical education. *J Med Edu* 49:1040–1050.
- Pinsonneault A, Barki H, Gallupe RB, Hoppen N. 1999. Electronic brainstorming: the illusion of productivity. *Inform Syst Res* 10:110–133.
- Schmidt HG. 2000. Assumptions underlying self-directed learning may be false. *Med Edu* 34:243–245.
- Smith S, Fryer-Edwards K, Diekema DS, Braddock CH III. 2004. Finding effective strategies for teaching ethics: a comparison trial of two interventions. *Acad Med* 79:265–271.
- Smits PBA, Verbeek JHAM, De Buissonjé CD. 2002. Problem based learning in continuing medical education: a review of controlled evaluation studies. *Brit Med J* 324:153–156.
- Tärnvik A. 2002. Advantages of using the multiple case method at the clinical stage of medical education. *Med Teach* 24:396–401.
- Thomas RE. 1993. Methods of teaching medicine using cases. *Med Teach* 15:27–34.
- Vernon DTA, Blake RL. 1993. Does problem-based learning work? A meta-analysis of evaluative research. *Acad Med* 68:550–563.
- Williams G, Lau A. 2004. Reform of undergraduate medical teaching in the United Kingdom: a triumph of evangelism over common sense. *Brit Med J* 329:92–94.