

Problem-based learning in the National University - Sudan: A reflection on the experience

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Abstract

Background: Since its establishment in 2005, the national university –Sudan (NUSU) has adopted problem- based learning (PBL) as an educational strategy and a teaching method. The increasing number of student’s intake every year and the turnover of staff had affected the way PBL sessions were conducted. Therefore, in 2014 a task-force was formed by the faculty of medicine to address the issue. **Objectives:** to investigate the status of PBL in the faculty of medicine and propose required measures. **Methodology:** A task force was formed by the faculty board. It consisted of a medical educationalist, a senior physician, and a physiologist. The group investigated the organization and implementation of PBL. It reviewed the current practice including the timetables, the problem scenarios and the students’ attendance records. **Results:** Most of the problem scenarios had no clear source or objectives. The implementation of PBL sessions depended on part-time tutors. There was no structured program for training of tutors. The students’ attendance for PBL sessions was notably poor. **Conclusion:** The task force presented their report including a proposal for actions to be taken. Training workshops for tutors were organized and timetables were restructured to properly accommodate PBL as an active learning method. Implementation of PBL requires continuous support for training of academic staff and provision of learning resources for the students. The use of e-learning should be considered as a future measure to increase the learning opportunities for students and as a solution to the issue of large groups teaching.

Key words: Curriculum, problem-based learning, problem-solving

INTRODUCTION

Since its introduction in medical education in Mc Master University in 1969,^[1] problem-based learning (PBL) has been adopted by many universities in teaching health sciences. In Sudan, the first university to adopt PBL as an approach to teaching was the University of Gezira in the 1970s. Ever since it has been adopted by many universities in the country, with each one modifying the concept to suit

their curriculum and strategy. Accordingly, the practice of using PBL varies from one university to the other. The National University - Sudan (NUSU) was established in 2005 as a private college for medical and technical studies. The college was upgraded to a university in 2013. The original curriculum for the Faculty of Medicine is an integrated hybrid curriculum that includes student-centered learning, lifelong learning, community-oriented learning as well as problem-solving as educational strategies. Problem-solving is used both as an educational strategy and an instructional technique. The curriculum is composed of system modules, in which basic medical sciences are integrated with the clinical ones. PBL is considered an important tool to

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achieve the vision of the faculty in graduating a lifelong learner, critical thinker, and a problem solver.^[2] This study is a reflection on the experience of NUSU in using PBL in teaching medical students. For clarity, the experience of NUSU will be described in three stages. The first stage is the period between 2005 to the review in 2014, the task force review, and finally, the current status.

THE FIRST STAGE (2005–2014)

The written problem scenarios were based on real life clinical experiences. Some of them were adopted from scenarios used by other national universities that preceded the NUSU in using PBL. Tutors were recruited on a part-time basis. Most of them were medical officers who are graduated from similar curricula that use PBL. Before each course, scenarios are discussed between the course coordinators and the tutors. PBL sessions were included in timetables. According to the curriculum directive, each week included one problem. In the first phase of the curriculum, semester 1, a course titled, “introduction to medicine and medical education” was taught to introduce the new students to the different methods of teaching and learning in NUSU. PBL is introduced at this level to explain the concept, the seven steps,^[3] the group dynamics, and the roles of the team members in the small group.^[4] A problem scenario is given to students as an exercise so that the students can practice the group discussion. An evaluation form is used by tutors to grade the students’ performance during each PBL session.

Over the years, the responsibility of the PBL fell almost entirely on the tutors. In 2012, the Centre for Professional Development (CPD) in the university invited experts and organized a workshop on PBL for academic staff from all disciplines in the university. The workshop focused on defining PBL with its different implementations, and how to write a scenario for a problem session.

THE SECOND STAGE (THE TASKFORCE REVIEW)

In 2014, the Faculty of Medicine formed a taskforce to review the situation of PBL within the college. The taskforce included a medical educationalist, a senior physician, and a physiologist. Their situation analysis stated the following:

Contents of the written scenarios

Most of the problems in use in teaching have an untraceable source and have not been revised for quite a time. Some of them were provided by the tutors themselves, under no supervision.

Most problems have two sessions within the timetable. An introductory one in which the tutor read out the problem and a second one in which the tutor supervises the discussion and answers the questions.

Group meetings

There are no actual student group meetings for discussion due to the following reasons: Lack of enough time within the crowded timetable, unavailability of rooms for group work, in addition to large number of students in each group (up to twenty per group).

Tutors

Tutoring is done by part-time tutors who have no full commitment to the college or the teaching schedule. They are graduates of other medical schools, some of which use PBL in a different format. They have no formal training in tutoring. According to the students’ feedback, most of the tutors answer the questions without any problem discussion.

Students’ attendance

The students’ attendance records of PBL sessions most of the times showed an average-to-poor attendance. The taskforce report acknowledged that problem-solving is a major educational strategy and a teaching method in the medical curriculum. It emphasized that the value of PBL does not reside in solving the questions of the problem but in motivating students’ active acquisition of knowledge and encouraging teamwork while training students on critical analysis and clinical reasoning. The report concluded that the way PBL sessions are being conducted in the faculty of medicine would not achieve the expected objectives.

The taskforce recommendations included the following:

- Even though small group teaching is originally used for PBL sessions,^[4] large groups can be used^[5] by reorganizing the timetable to allow free time for independent learning (student-directed learning [SDL])^[6] and group meetings. Different groups can use the same facility by meeting on different times of the day
- The problem scenarios have to be revised and rewritten if necessary and should be reviewed periodically. A PBL unit is headed by a physician and has heads of departments as members; can oversee both revision and rewriting of those problems. All the problem scenarios should be presented by the course coordinators to the unit for review before the course starts. The unit review is to include the scenarios of the problems, the objectives, their relevance to the course, and the suitability of the problem to the level of students. Problem scenarios should be given to the students only after approval by that unit. Each problem should have clear written objectives for the tutors
- The college should decide whether tutoring should be done by experts or nonexperts.^[7] On either choice,

tutors should be committed to the regulations and policies of the National University. Their jobs should be controlled by a binding contract. Their educational background and expertise should be verified as with any other job within the college. The college should provide training for the appointed tutors at the beginning of the academic year.^[7] Written guidelines for the college policy on tutoring should be provided to them. By doing that, a unified method of tutoring problem-solving sessions is ensured. It should be clear that nonexpert tutors are not expected to teach. However, they should be able to answer questions and/or interfere when required^[8]

- Assessment of the students' performance in problem session is necessary for the motivation of learning as well as evaluation of the outcome of the learning experience. It should include participation in teamwork, critical thinking, and clinical reasoning as well as achieving the objectives of the problem^[9]
- Students' feedback on problem-solving sessions and tutors should be sought regularly. It should be used for formative assessment of problem-solving sessions. This can be included within the regular end of course evaluation student questionnaire^[7]
- The number of sessions for each problem was proposed to be either one or two sessions [Table 1].

As shown in Table 1, the one-session option will be led by an expert. Depending on the size of the class, a tutor can be present for organization of in-class discussion. The scenario is introduced at the beginning of the lecture for induction. This solution may limit the number of needed tutors, but it limits the time allowed for further reading and discussion as well.

On the other hand, the two session's solution requires trained committed tutors. A lecture by an expert/specialist can be scheduled in the timetable after the group discussion for a wrap up.

Table 1: Proposed PBL sessions modes

| Number of sessions | One-session mode | Two-session mode |
|---------------------------|---|---|
| Tutor (noncontent expert) | Specialist (content expert) | Specialist Tutor |
| Content of the session | Introduction Clarify wordings and terms Workout objectives Organize in-class small group discussion Wrap up with a lecture/presentation | Session 1, by a specialist Introduction Clarify wordings and terms Workout objectives Session 2 Tutor-led group discussion |

ACTIONS TAKEN

According to the above-mentioned findings, workshops on PBL/problem-solving and tutoring and facilitation skills were organized for all faculty members. Guidelines on PBL explaining the group dynamics, the different roles within the group,^[4,5] and steps in the session were distributed.^[9]

It was agreed that all problem scenarios should be reviewed by the course committee which include the heads of departments within the Faculty of Medicine before being given to the students. Written scenarios were designed to be as realistic as possible, relevant to the common clinical problems within the community, relevant to the course objectives, motivating to the students, and suitable for the students' level of knowledge.^[9] The faculty recognized the need for more staff for tutoring problems. A supervisor for problem-solving implementation was appointed to follow the recruitment and organized training of tutors. His/her job includes ensuring that all problems have been reviewed before the beginning of courses. The new recruits for tutoring were trained at the beginning of each academic year by the CPD. Each is provided by the written college guidelines on facilitating and tutoring problem-solving sessions.

The third stage (current situation)

- Tutoring and problem-solving session's supervision by a full-time staff proved to be a very effective solution. All problem scenarios have been revised and rewritten to match the course objectives.

Tutors' educational background is regularly checked and training is provided for newcomers. Their performance is closely monitored using student feedback, course coordinator follow-up, student attendance, and performance records in their examinations.

- Each course timetable has a problem scenario for each week of the course. Each problem has two sessions allocated in the timetable. The 1st session (at the beginning of the week) is presented by a specialist and a tutor to the whole class. In this session, the scenario is read, words and terms are explained, and the students are encouraged to identify the objectives of the problem which are then discussed with the whole class.

The groups meet on their own free time (SDL) to discuss the problem and explore the ways of solving it.

In the second session (scheduled at the end of the week), every tutor meets with his/her group to discuss their findings. Tutors are trained to facilitate and interfere only when required.

- The main objective of problem scenarios in the preclinical courses is to integrate the basic medical sciences with the clinical presentations in real life. Students should focus on how to approach the problem as a team; starting by defining the main problem, formulating questions to acquire the information needed to understand all aspects of the problem, gathering the needed information, and analyzing their findings to reach a solution. The objectives in the clerkship courses are focused on using critical analysis and clinical reasoning to reach a diagnosis and a management plan of clinical problems.

CONCLUSIONS

Medical schools using PBL adapt the educational strategy to suit their curricula, number of students, and available resources.

The Faculty of Medicine in NUSU has adopted problem-solving as a strategy and a method of teaching. A PBL curriculum requires continuous support for both academic staff and students.^[10] Resources should be made available for regular training opportunities for academic staff development. Learning opportunities and resources should be made available for students at all times to support the process of acquisition of knowledge. The use of E-learning resources including online meetings may be considered a future solution for the large number of students. Regular

review and follow-up of the actual implementation of these strategies within the curriculum is necessary to ensure that the objectives of the curriculum are met.

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Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Neville AJ. Problem-based learning and medical education forty years on. A review of its effects on knowledge and clinical performance. *Med Princ Pract* 2009;18:1-9.
2. Undergraduate Prospectus. National University-Sudan. 3rd ed. Khartoum: National University-Khartoum; 2015. p. 24-5.
3. Davis MH. AMEE Medical Education Guide No 15: Problem-based learning: A practical guide. *Med Teach* 1999;21:130-40.
4. Walton H. Small group methods in medical teaching. *Med Educ* 1997;31:459-64.
5. Roberts C, Lawson M, Newble D, Self A, Chan P. The introduction of large class problem-based learning into an undergraduate medical curriculum: An evaluation. *Med Teach* 2005;27:527-33.
6. Kanter SL. Fundamental concepts of problem-based learning for the new facilitator. *Bull Med Libr Assoc* 1998;86:391-5.
7. McLean M, Van Wyk J. Twelve tips for recruiting and retaining facilitators in a problem-based learning programme. *Med Teach* 2006;28:675-9.
8. Azer SA. Challenges facing PBL tutors: 12 tips for successful group facilitation. *Med Teach* 2005;27:676-81.
9. Wood DF. Problem based learning. *BMJ* 2003;326:328-30.
10. Newble DI, Cannon RA. Teaching in a problem-based course. In: *A Handbook for Medical Teachers*. 4th ed., Ch. 7. Netherlands: Springer Science and Business Media; 2007. p. 111-2.