

From teaching to-self training, i.e. Problem-Based Learning — a letter to the Editor

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I read the paper by Willem van Hoorn and the commentary by Małgorzata Tafil-Klawe with great interest. Both of them clarify the need to introduce Problem-Based Learning (PBL) into the medical education system [1, 2].

This meets my personal experience gathered during my visit to the University of Salford (United Kingdom), where the PBL system has been successfully introduced into the education of health care professionals in the Directorate of Radiography. The university provides BSc and MSc courses in Diagnostic Radiography and postgraduate courses in specialised fields of imaging, such as Nuclear Medicine, Mammography and Medical Ultrasound. During the whole educational pathway the students not only memorise professional routines but they are encouraged to critically appraise, design and perform scientific research as well. The key to joining these two aspects is delivering of the aims and intended learning outcomes through PBL. Students are expected to take an active role in the learning process, taking responsibility for their own learning, establishing what they want to know, why they need to know it, and to be able to evaluate each item of information critically before accumulating it within memory. PBL enables them to learn „in context”, relating the gathered knowledge to the previously presented problem. All students learn at their own pace, in their own way, using their own choice of resources. This is particularly important considering individual differences in capacity of knowledge and intellectual abilities, necessitating different learning methods. Apart from the self-directed learning during tutorials, students are strongly encouraged to work in groups. The tu-

torial group is an excellent forum for opening up discussion, activating prior knowledge and generating ideas. It allows verification of personal judgments and promotes practice in communicating.

Before the first assignment students are presented with a videotaped example of a PBL facilitated tutorial. They are also provided with a written scenario of the problem delivery process, which is repeated in each PBL session, and with a set of the problems (triggers) for the semester. Each week is a separate session with different learning objectives connected to the given trigger. During the first week a group contract should be agreed. This set of rules is to be negotiated by debating the broad issues, such as tutor's and students' mutual expectations, roles, participation and questioning, individual responsibility, methods and places of study, the use of the resources, ways of contribution to the group. All members of the group debate the issues of the contract and should come to a mutual agreement as to what is acceptable and unacceptable behaviour. This contract should form the basis for the group to work during the module and can be used to resolve group conflicts if they occur. A special emphasis is put upon the active participation of every member of the group and creating psychological comfort when working together during tutorials.

Generally the role of the group facilitator (who should be considered as an integral member of the group) is to give guidance to the group and to support the process of learning. Although as a group member the tutor has expertise in the subject, (s)he is not to act as a resource person to tell students what to do and how, but to ensure proper information is received by the group. The tutor may give some clues to the group, but never tells students how to use the information. The students on the other hand are free to ask for suggestions, advice and guidance, but not for specific information about the problem that is being developed.

The new PBL module starts each week with the facilitated tutorial. Each tutorial lasts approximately for 3 hours and is divided into two sessions. During the gathering the group is presented with the problem (trigger) which is to be discussed and processed within the following week. Triggers may be for example radiographs, objects or written scenarios. The trigger should enable the student to explore the knowledge and issues surrounding aspects of the learning outcomes. To ensure the active participation of each student, a Chairperson and a Scribe are elected from the

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group for each session. The Chairperson executes the scenario based on Schmidt's Seven Steps system [1, 3], names each stage and moderates discussion about it, while the Scribe writes the ideas for later inspection. At the end of the first stage everyone in the group should understand and be in agreement about what the terms and concepts in the „trigger“ mean and entail. In the second stage all the group members must be aware of what problems are to be dealt with. The third step is the brainstorm analysis of the problem and noting down all the ideas. Stage four is the evaluation of the ideas, looking for connections, categorising and sorting out irrelevant information. The final stage for the actual tutorial is generating the learning objectives by setting concrete targets for the learning need.

After the tutorial the self-learning process begins. The group (or each group member) should make it clear for itself how they will effectively obtain the needed knowledge. During the time of self-evaluation the students are offered additional teaching and learning methods in order to enable them to develop the underpinning knowledge required to ensure effective individual learning. Computer skill labs should equalise differences in the proficiency in computer use. A dedicated electronic learning environment is used as a communication and administrative tool. Also the lectures and fixed resource sessions are well matched with the week's trigger. The students are encouraged to produce a word-processed resume of the gathered information and to exchange it with other group members via e-mail whenever a student finds a particularly good source.

The last stage, which is the synthesis and checking of the acquired information, takes place in the first part of the PBL tutorial the following week. The newly acquired knowledge should be scrutinised and described in relation to the problem. The gained information should elucidate the trigger and answer the questions put by the group.

At the end of every five weeks, assessments are designed to give feedback upon students' performance and development. There are two forms of measurement used:

- formative assessment, based on the tutor's judgement upon a student's participation in the group process, critical reasoning, manner of knowledge presentation and interaction with other group members;

- summative assessments, including a word-processed assignment and an examination, each contributing equally towards the mark for the module.

Because it is vital to the PBL process to be evaluated, modifications can be made to the future use of the method. The PBL module is assessed using students' and tutors' opinions. At the end of each week the group should comment on the PBL process. This may include discussion of resources, group interactions, effectiveness of the learning or other problems. Views of the students are gathered using questionnaires and by inviting students representing groups to group interviews.

Conclusions

In my opinion the main advantage of the PBL-based working through a trigger is encouraging the students to be conscious and active administrators of their knowledge and abilities. The system evokes the comfort of being aware of the usefulness of both the prior and newly acquired knowledge. Also the tutors should favour PBL courses because generally they give an opportunity to speak less and to think more.

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