Author
Ritchie, Sophie (Glasgow GB)
University of Stractclyde - National Centre for Prothetics and Orthotics

Title
The Use of Problem–Based Learning to Teach Upper Limb Prosthetics

Coauthors
Mclaughlin BG, Ritchie SL

Summary
In recent years the staff of the NCPO have adopted a problem based learning(PBL) approach to upper limb teaching. This teaching model has proved to be very successful as it encourages deeper learning and equips the students with the skills required to assess and treat upper limb amputees.

Introduction
The prosthetic management of upper limb amputees requires a wide range of skills and a depth of knowledge that many experienced prosthetist take for granted. It has therefore always been a challenge for educators to ensure that graduates enter the profession with the appropriate skills to be able to effectively manage any patient. For this reason staff of the NCPO have adopted a problem-based learning (PBL) approach to upper limb prosthetic teaching to ensure that our graduates are ready to meet this challenge.

Unlike more traditional methods of teaching, where students are presented with the information they are required to learn, during PBL a problem/question is posed requiring students to question, speculate and generate a solution. This method therefore encourages active and independent learning focused round a clinical problem, enabling students to arrive at general principles and concepts which can be applied to other situations.

Methods
Students need to find academic activities meaningful and worthwhile. This is evident in PBL where real life problems become the context in which students learn academic contents and professional skills. PBL offers a number of real benefits to education in the healthcare professions:

• Structuring learning round clinical problems increases the relevance of teaching.
• Develops generic competencies and transferable skills.
• Encourages effective reasoning processes
• Supports self directed learning skills.
• Allows the student to take more responsibility for their learning.
• Encourages a deep approach to learning.
• Develops group skills for working with colleagues.

Previous findings have also indicated that:
• PBL students are better able to apply what they have learned to clinical practice.
• PBL students have better recall of information within a context

All these known benefits are in line with the NCPO's overarching aim to graduate the highest standard of professionals.

Results
Problems/scenarios are selected so that at the end of the program the learner is ready to move directly into the workforce. Traditional levels of content coverage are therefore considered less important, instead students learn the skills for seeking out the required knowledge as the occasion demands.

This is achieved by:
• Splitting the students into small, intimate groups.
• Putting the onus on the students to decide what they need to know.
• Encouraging students to reference theory, past experience and similar cases.
• Allowing students to ask questions and test possible answers in discussion and practical trials relevant to the problem that has been posed.

A system of continuous assessment, on many small activities throughout the module, combines to give each student their own module grade. This method ensures that deeper understanding and problem solving skills are at the forefront of assessment, rather than a more traditional emphasis on factual recall and memorization.

Conclusion
This teaching model has proven to be very successful in encouraging the students to engage in the learning process. When faced with a real upper limb amputee to care for, learning all the
necessary knowledge leading to the treatment of this patient is a worthwhile activity for students and learning is usually more enthusiastic.

It has always been the case that to teach or expose students to every challenge seen in an upper limb prosthetic clinic is impossible. However, unlike more tradition declarative methods of teaching, it is felt that the skills students develop through PBL equip them with a greater ability to achieve a successful outcome for each patient they treat, making them better prepared for the reality of working within the specialised but rewarding field of upper limb prosthetics.

References