PROBLEM-BASED LEARNING EARNS GOOD GRADES

by Sandra McCleaster RRT

The effectiveness of Problem Based Learning (PBL) as a learning strategy is the topic of this Focus article. It's a follow-up to my overview on the subject in the last issue. In review, PBL describes the learning that results from the process of working toward the solution of the problem. I concluded that last article by wondering in writing if PBL was all that it had been cracked up to be.

It took only a cursory review of the literature to find out that PBL has a lot going for it. But clearly, the going can be tough.

For starters, the problem-based approach can be very time intensive. Plus, devising appropriate and credible case-based problems isn't easy. Faculty needs to be trained and so far, there seems to be a shortage of those practised and willing to do it. Modern day students are often accustomed to being spoon-fed. PBL puts them unsure of expectations; so when faced with the initial confusion of PBL, they don't always "get" it. In a group situation, the division of labor isn't always equitable. This makes grading difficult. In traditional classrooms, grading has always been based on what students "know". In PBL, it's based on how well they think.

Nor is PBL always appropriate for lower level students. Some education traditionalists believe you shouldn't attempt it at all until students have a good grip on course content and have a sound grasp of fundamentals. On the face of it, this makes sense, but actually runs counter to the true definition of problem-based learning, in which problem solving actually takes place before students have the information necessary for solution.

But, as it turns out, these problems are not insurmountable and there are a number of researchers who feel that the end results are well worth the extra effort.

The early proponents of PBL held the common belief that PBL would strengthen clinical reasoning and problem-solving skills. So I set out to do a search of the literature to see if PBL does in fact, promote the development of that elusive quality of critical thought. It didn't take me long to find that there is a lot of evidence on problem based learning in medical education. Here's an overview of what I found:

Albanese & Mitchell are pioneers in PBL research. A 1993 summary of their work reveals that students in PBL-curricula exceeded traditional students in clinical knowledge tests and clinical performance. In a second study (Baker, 2000), in areas of both clinical ratings and student satisfaction, the data consistently favored problem-based learning.

Another yet-to-be published New Jersey study (Ceconi, 2005) examined the outcomes of PBL strategies on the decision-making skills of baccalaureate degree respiratory therapy students. This research examined the decision-making scores from the National Board for Respiratory Care (NBRC) Clinical Simulation examination for both lecture-based and problem-based students. As it turned out, statistically significant positive differences in exam scores by type of curriculum were found. These outcomes are consistent with other studies undertaken in both medical and dental education.

In contrast though, Will Beachey (2004) from the University of No. Dakota undertook a study to compare PBL with conventional curricula also at a four year BS degree program in respiratory care. In addition to the NBRC national board exam scores, he looked at graduate and employer ratings of cognitive, psychomotor and affective qualities. Although he found no significant differences between the PBL experienced grads and those who'd been through a traditional curriculum, he did find that PBL did not place graduates at any disadvantage. His single significant finding was that PBL graduates are more satisfied with the quality of their education.

In nursing education, Marie Cooke and Kadie Moyle (2000) solicited student evaluations on the use of PBL over a four-week period in an otherwise traditional nursing program. They received a 79% response. Although more perceptive than scientific, many reported subjectively that this approach to learning certainly promoted their critical thinking skills. Their analysis also suggested that PBL is a more rewarding and satisfying learning approach for students in practice-based programs. Four weeks is a short trial, but the positive response is consistent with the student satisfaction factor in several other studies and is noteworthy. In fact, in many studies there was a mention of student satisfaction with the PBL approach. It seems that once students overcame the initial confusion of PBL and got the "hang" of it, they reported genuinely liking it. This alone says a lot.

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In the area of basic sciences, academic performance on a standardized oral comprehensive exam was compared for students in a PBL curriculum versus a lecture-based curriculum. (Login 1994-96). Students were graded using both a standardized scoring system and a subjective faculty assessment. The mean exam scores didn't turn out to be significantly different; there was however, a huge (269%) increase in positive examiner comments with regard to students' ability to think and communicate.

On another front, a number of educators who were grad school students in a course on Theories of Teaching and Learning were interviewed with regard to their perception of problem-based learning. Overall, all had a favorable attitude, stating they had "achieved more than just prescribed learning." They too had mixed feelings in the beginning, but by the end, they were enjoying it very much.

There's one final important point to note. Even though PBL had its origins in medical education, it seems that no one's been able to study the effects of Problem Based learning on the quality of patient care.

As I stated in my last article, conducting high quality research on the effectiveness of PBL is challenging for many reasons. There are simply too many variables to be considered. The very fact that PBL takes on various forms and is interpreted in so many different ways makes it extremely difficult to evaluate. For instance, some institutions incorporate some element of problem-solving in the curricula and call it PBL when in fact it is not. There are different operational definitions, various approaches to implementation, whether it was the entire curricula or a single course, a wide range of study designs and different outcome criteria. But all in all, as an educational innovation, the literatures gives a collective "thumbs up" to Problem-Based Learning.

Over the years, one thing has become very apparent: Education is best when it is an interactive process. The academic community has come to accept that traditional education needs to become more interactive. Problem Based Learning certainly lends itself well to this notion, but how educators go about it depends on the subject at hand, the available resources and the level of students. Whether that's best accomplished via PBL or the other learning innovations we've read about, still remains to be seen.

Red Blood Cell Indices... *Continued from page 58*

Thrombocytopenia means platelet deficiency or a low platelet count. It is commonly associated with leukemias (lymphocytic, myelocytic, monocytic), anemias (aplastic, iron deficiency, pernicious, folic acid deficiency, sickle cell), liver disease (cirrhosis, chronic active hepatitis), kidney diseases, cancer (bone, gastrointestinal tract, brain). The most common place therapists will see increased levels of thrombocytes in COPD patients with polycythemia. Other conditions that increase platelet counts are trauma (surgery, fractures), postsplenectomy, acute blood loss (peaks in 7-10 days), metastatic carcinoma, pulmonary embolism, high altitudes, tuberculosis, severe exercise. Epinephrine will also increase the platelet levels. Other drugs will have the effect of decreasing platelet counts. These drugs include, but are not limited to, antibiotics (chloromycetin, streptomycin), sulfonamides, aspirin, quinindine, quinine, diamox, amidopyrine, thiazide diuretics, and certain vaccine injections, as well as chemotherapeutic agents. It is important for us when working with a patient with known low platelet count that we do all we can to protect them from injury. This is particularly important for the therapist who works in pulmonary rehabilitation. A patient can fall from a treadmill and literally shear off an outer layer of skin and bleed like the proverbial "stuffed pig".

So what is the simple take-home message about indices and platelets? Indices give good information about potential hypoxemia and hypoxia. The RDW is a useful early indicator of anemia even before the patient has symptoms. The platelet count has special importance for the pulmonary rehabilitation therapist. And all therapists should pay more attention to it because a variety of drugs and medications can affect the platelet activity and count.

Don Steinert is an Associate Professor in the Department of Nursing and Allied Health at the University of the District of Columbia. He is a faculty member in the Respiratory Therapy Program and is involved in basic science and interventional health disparities research.

Sleep Text Review... *Continued from page 60*

treatment with clonazepam, 1.5 milligrams at bedtime, promptly and completely controlled her problem.…Her brother and a grandmother also had sleepwalking persisting into adulthood.

In this book, physician and scientist, Schenck, tells his story of helping discover the "dream-enacting" disorder. RBD is now recognized as one of the most important clinical discoveries on sleep since the time REM sleep was discovered in 1953. Dr. Schenck has also helped discover other parasomnias, and in this book he also discusses the science of parasomnias, and its connection with the brain sciences, clinical medicine, psychology, law and literature.

This book should interest people impacted by parasomnias or other sleep disorders; and those interested in sleep, dreams, and human behavior from various perspectives; students and professionals in medicine, nursing, sleep technology, biology, neuroscience, law, psychology, sociology, anthropology, and other fields. It should be an addition to every sleep disorders center library collection so that it may help raise the awareness in all professionals involved in sleep disorders diagnosis. Paradox Lost… includes Schenck's opinions and insights but also clearly demonstrates his understanding and compassion for the complexities faced by RBD patients and their families. By reading this excellent book, caregivers may become more engaged in spotting signs of the harrowing disorder in their patients, or recognize RBD as a comorbidity to the primary disease of interest.