BIOCHEMISTRY AND MOLECULAR BIOLOGY EDUCATION
Vol. 30, No. 6, pp. 422–423, 2002

Meeting Review

PBL 2002: A Pathway to Better Learning

June 16–20, 2002, Baltimore, Maryland

"We are in the midst of a technological revolution, no less important than the invention of the printing press." Clyde "Kipp" Herreid, of the University at Buffalo, State University of New York (SUNY),[1] was of course referring to the revolution in information technology. In his after dinner speech as Keynote Speaker at the opening banquet of PBL 2002 on Sunday evening, Kipp took the entire audience on a decade-by-decade look at the advances in information technology beginning with 2010 and culminating in the year 2061, the year in which everyone in the world will be scientifically literate (oh, if only we could hope that that would be true). And although most of us will not be around to see whether Kipp's prognostications will come to pass, his entertaining talk set the stage for problem-based learning and the role of technology in the learning process.

PBL 2002: A Pathway to Better Learning was an international conference on problem-based learning in higher education held in Baltimore, MD on June 16–20, 2002. Sponsored by the University of Delaware, the Institute for Transforming Undergraduate Education (ITUE), the Unidel Foundation, and the Pew Charitable Trusts, the meeting featured more than 400 participants from 26 different countries. To quote from the organizers: "PBL 2002 brings together experienced PBL educators so that they can share their insights with one another as well as support those who are interested in using this method for the first time." And share we did, from lively question-and-answer sessions following paper presentations from active participation at panel discussions and workshops. Discussions continued in the hallways of the Baltimore Convention Center and over meals as participants eagerly exchanged stories about effective classroom activities and transforming educational experiences. "I enjoyed the meeting because it was my first of its kind, and I found those in attendance to be approachable and friendly," said Mary Peek, a biochemistry laboratory instructor and graduate student supervisor from Georgia Tech. "I am more aware now of the community of professors who practice PBL, which is helpful for exchanging ideas and creating moral support." Christopher Jones of Moravian College agreed. "What was most useful to me was having a chance to talk with others, sharing specific ideas and examples of what has worked and what hasn't."

While Kipp took his audience "Back to the Future" on Sunday evening, the following morning, Keynote Speaker P. K. Rangachari (Chari), professor of medicine at the McMaster University in Canada,[2] took a look at the past. Sprinkling his talk with references to Shakespeare, Yeats, and Francis Bacon, Chari described different learning models to explore how our students learn and how we, as educators, could effectively promote active learning. Indeed these issues were the major themes of the conference as attendees explored how the techniques employed in problem-based learning could be used to teach our students content in context, promote higher order thinking skills, and engage the students as self-directed, active learners.

The conference featured a wide variety of activities. Introductory workshops and discipline-specific workshops (in education, social sciences, health sciences, humanities, biochemistry, and engineering/physics) were offered as part of the pre-conference program. Each day of the 4-day conference began with a plenary session featuring a keynote speaker. Keynote speakers in addition to those already mentioned included Maggi Savin-Baden of Coventry University in the United Kingdom,[3] Karl Smith of the University of Minnesota,[4] and Oon-Seng Tan of the Nanyang Technological University in Singapore.[5] Following the plenary session, conference participants could attend paper presentations or workshops. Paper presentations explored topics of faculty and student development, research on PBL, PBL and technology, and PBL and distance learning. Papers were presented in various disciplines, including business, engineering, physics, chemistry, life sciences, health sciences, and social sciences. Presenters described effective classroom experiences and provided illustrations of their favorite problems.

A dozen different workshops were offered each day on all aspects of the PBL process including writing effective problem-based materials, implementation of PBL strategies in a wide variety of courses, facilitating group work, group dynamics, managing student groups effectively, and providing assessment to name a few. Participants new to PBL found these "how-to" types of discussions to be most helpful.

While all of the conference attendees were committed to the idea of problem-based learning, there were some differences of opinion as to what constituted "problem-

[1] Clyde Freeman Herreid is a Distinguished Teaching Professor at University at Buffalo, SUNY and is the director of the National Center for Case Study Teaching in Science. Cases can be found online at ublib.buffalo.edu/libraries/projects/cases/case.html. He writes a column on teaching with case studies for the *Journal of College Science Teaching*.

[2] P. K. Rangachari has compiled a casebook of problems that can be found at www.fhs.mcmaster.ca/pbls/writing.

[3] Maggi Savin-Baden's book *Problem-Based Learning in Higher Education: Untold Stories* was published by the Society for Research into Higher Education and Open University Press in March 2000.

[4] Karl Smith is a Distinguished Professor of Civil Engineering at University of Minnesota and has published several books on problem-based learning, including *How to Model It: Problem-Solving for the Computer Age* and *Strategies for Energizing Large Classes: From Small Groups to Learning Communities*.

[5] Oon-Seng Tan is the Director of the Temasek Centre for Problem-Based Learning and is editor and co-author of the book *Problem-Based Learning: Education Innovation Across Disciplines*.

based learning." What exactly is PBL? How does it differ from case study analysis? Are students given no information? Are students given some information? How much guidance does the teacher-as-facilitator provide? How is the students' work assessed? And although there seemed to be some consensus that lecture delivery of content material was efficient but perhaps not effective in promoting retention of that material to the lectured students, there was some discussion about the role of the lecture as a teaching tool. Some attendees had completely abandoned the lecture and had designed their entire courses around problem-based learning, while others used a "hybrid PBL" approach that featured lectures in addition to PBL exercises.

Particular attention was paid to the role of faculty member as facilitator. Several of the keynote speakers spent all or part of their talks on problem-based learning facilitation and the impact of the facilitator on student learning. Most educators feel comfortable and competent in their roles as lecturers, and a transition to a problem-based learning format requires the professor to step out of the role as dispenser of all knowledge and into a role of facilitator of student learning, a role for which we are generally not trained. Teachers who wish to be facilitators might find information and training on effective facilitation at conferences like this one. Some instructors, in addition to functioning as facilitators themselves, have chosen to use graduate students or upper level undergraduates as facilitators so that PBL-based exercises can be carried out in very large classes. For example, a program designed by Terry Platt and Vicki Roth is in place at the University of Rochester to formally train upper level students to be facilitators of groups in large lecture courses.[6]

Special thanks should be given to ITUE Faculty leaders and conference organizers from the University of Delaware for their hard work in making PBL 2002 a success: Deborah Allen, Barbara Duch, Susan Groh, Valerie Hans, George Watson, and Hal White. And thanks should also be given to Hal White and Ed Wood for organizing the biochemistry pre-conference workshop. Many who attended the pre-conference workshop found that having the opportunity to discuss some of the important PBL issues prior to the beginning of the conference was valuable in focusing their attention on these issues as the conference progressed.

Perhaps the entire conference could be summarized by this statement from Ed Wood's[7] paper presentation: "PBL encourages active learning and the development of higher order thinking skills, so why don't we just get on with it?"

Kathleen Cornely
Department of Chemistry and Biochemistry,
Providence College,
Providence, Rhode Island 02918

[6] Terry Platt, Department of Biochemistry and Biophysics, and Vicki Roth, Dean of Learning Assistance Services, can be reached at tpla@mail.rochester.edu and vrth@mail.rochester.edu, respectively.

[7] E. J. Wood is a professor at the School of Biochemistry and Molecular Biology at the University of Leeds, United Kingdom and is a former editor of *Biochemistry and Molecular Biology Education*.