

APR10-2009-000106

Abstract for an Invited Paper
for the APR10 Meeting of
the American Physical Society

Excellence in Physics Education Award Talk: Sharing Active Learning Strategies in the Developed and Developing Worlds

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Since the first series of National Microcomputer Based Laboratory (MBL) Institutes for Teachers of Physics in Summer, 1987, the Activity Based Physics Group (ABP) has presented numerous professional development institutes and workshops to thousands of high school, college and university faculty, sponsored by National Science Foundation, U.S. Department of Education, Howard Hughes Medical Institute and others. An overview of these programs and details of our instructional strategies will be presented. Some common features of these include: (1) motivating participants through introduction to active learning research literature, including exposure to conceptual evaluations and student learning gains in traditional and active learning courses, (2) exposing participants to active learning strategies through intensive hands-on work using classroom tested curricular materials, (3) relying on these materials to enhance teacher knowledge and correct misconceptions—when necessary, (4) providing opportunities to practice active learning instruction with other participants and (5) distributing or facilitating procurement of equipment and supplies needed to get started. Recently, ABP group members have been working with physics educators from other countries to introduce active learning strategies in the developing world. New programs such as Active Learning in Optics and Photonics (ALOP, UNESCO) and Physware (ICTP/UNESCO/IUPAP), that support active learning using low-cost equipment, have been developed for this purpose. To date, ALOP workshops have been presented to over 500 secondary and college faculty in Ghana, Tunisia, Morocco, India, Tanzania, Brazil, Mexico, Zambia, Cameroon, Colombia, Nepal and Chile, and the ALOP Training Manual has been translated into French and Spanish. The first Physware workshop, held at ICTP in Trieste in 2009, had 32 participants most of whom were from developing countries in Africa, Asia and South America. These programs will be described.