Project Kaleidoscope (PKAL) at WSU
Case Study Report Submitted January 19, 2007
PKAL Inquiry Task Force Site Visit to WSU March 12-13, 2007

Project Kaleidoscope (PKAL)
www.pkal.org

• Building and sustaining strong undergraduate programs in STEM
• Learning environments that attract and sustain undergraduate students
• Motivate students to consider careers in related fields
• Build scientific literacy among non-science students
• Equip faculty and administrators (individually or in teams) for leadership in reform at the local level

“From the beginning, PKAL has taken a kaleidoscopic approach to the work of reform.”

“In response to the question ‘What is PKAL?’ Director Jeanne Narum answers: Our world is one in which science and technology have a profound impact on every aspect of life. PKAL is part of the growing national effort, using the energies and expertise of leaders within the undergraduate STEM community, to prepare coming generations for that world, for lives that are self-fulfilled, productive, and of service to society.”

PKAL Leadership Initiative

“With continuing support from NSF, PKAL is undertaking a leadership initiative (2004 - 2007), convinced that if the current momentum to transform the undergraduate learning environment is to be sustained there must be:

• an informed cadre of leaders taking advantage of new opportunities facing their campus community
• buy-in at the institutional level to support the work of these leaders
• persistent opportunities to learn from those, having documented success in transforming the culture and arriving at policies and practices that succeed—over the long-term—in supporting strong undergraduate STEM programs.”

~60 Leadership Institutes (LI) accepted into the program. WSU approved as an LI in Fall 2006.

“There are three dimensions of PKAL's leadership initiative, focusing on the work of leaders in:

i) setting and articulating a vision and

ii) dealing with the complexities and policies of change, together with

iii) a focus on taking personal responsibility for leadership.”

Case Study Report

• WSU is one of 12 Leadership Institutes chosen to submit a Case Study Report
• Core effort to document success of PKAL Leadership Institutes
• PKAL Inquiry Task Force: “Recognizing that LI institutions and teams are at various stages in their proposed endeavors, PKAL would nevertheless like to begin to discern “what works” in creating and supporting STEM leadership for institutional transformation. To that end an advisory committee, the LI Inquiry Task Force, has begun to collect information regarding projects, progress and challenges from LI participants. Our goal is to assemble a picture of best practices that will benefit all of us committed to transformative STEM leadership. This particular request focuses on your individual experiences and reflections”
• WSU’s Inquiry Task Force Team will be Jeanne Narum and Adrianna Kezar.

As PKAL Director, Jeanne Narum has a variety of responsibilities, all focused on building leadership at the institutional and national levels to ensure that American undergraduates have access to robust learning experiences in STEM fields.

Adrianna Kezar, Associate Professor for Higher Education, University of Southern California. Kezar holds a Ph.D. 1996 and M.A. 1992 in higher education administration from the University of Michigan and a B.A. 1989 from the University of California, Los Angeles. She joined the faculty at USC in 2003.

• 2-day site visit March 12-13

**PKAL meetings topics addressed by WSU teams**

• Research-rich environments
• Science-for-all
• Building interdisciplinary learning environments
• Communication

**The College of Science & Engineering “Vision” (under continuing development)**

_Provide interdisciplinary, research-rich learning environments that ensure the success of all students, and that provide all students with challenging and meaningful STEM education_

**Goals for turning vision into reality**

• Development of shared vision, responsibility, participation, and enthusiasm for student experiences in STEM across the institution
• Effective communication
  - Web communication methods
  - Newsletters
  - Informal gatherings
• Nurturing of a culture of support for innovation, focus upon teaching and learning, transparent decision making, and college/university-wide perspectives which transcend traditional barriers
• Leadership development of college chair’s group
• Cross-departmental teams
  - Investigative Science Advisory Team
  - SEM Design and Evaluation Team
• Synergy with Existing University Efforts
  - L21 and existing Learning Communities
  - First-year experience
  - Presidential Workplan
  - Internal and external university collaborations and partnerships
  - CLASP
• Continuing promotion of inclusiveness in STEM experiences throughout WSU leading to the adoption of PKAL innovations into the fabric of the university
Outcomes and Observations

- The effects of PKAL participation, whether direct or indirect, have reached across the entire campus. Some examples are
  - Faculty local redesign of introductory and sophomore-level courses to explicitly build students’ research skills
  - STEM programs developed and/or enhanced by availability of the WSU Riverboat Explorer
  - Upper Mississippi Environmental Sciences Center (UMESC) collaborations offer internship, research, and summer employment opportunities for students at the USGS office in La Crosse, WI
  - Curricular modules under current development for the Table-top Scanning Electron Microscope provided to WSU by agreement with FEI
  - Ongoing grant proposal development for programs in STEM and STEM education
  - Bioinformatics/Biosciences collaborations with Mayo Clinic, Olmstead Medical Center (Rochester, MN), and other Center for Integrated Health Science Education and Practice (CIHSEP) partners
  - Science for all/Interdisciplinary experiences contained in Arts, Drawing, and Dance for the Sciences courses
  - Implementation of Investigative Sciences curricula for Elementary Education majors
  - CLASP and the recent “Does Science Matter?” series
  - Interdisciplinary experiences for students interested in forensic science in introductory biology (Basics of Life course), where a murder mystery is staged, in Investigative Science, where students likewise identify a criminal based on soil analysis, and a new Forensics class in Chemistry, designed through discussions with Criminal Justice faculty concerning the scientific consideration of evidence.

- WSU has been amongst the leaders in LI institutions for the number and breadth of successfully introduced initiatives. About 1/3 of faculty in the College of Science & Engineering and some faculty/staff/administrators from the larger campus community have been directly involved. While the results of these individuals and teams have been significant, current efforts are underway to further increase the participation rate, ultimately promoting greater sustainability of introduced initiatives.

- Institutional investment in sending large teams (8-15 participants at each PKAL workshop) seen as both beneficial to WSU and as a model to other institutions

- Sustaining enthusiasm may be a challenge, specifically at times when it becomes difficult to work on the intellectual and educational priorities due to several periodic reporting demands (e.g., university studies assessments and course re-approval process, program reviews, accreditations, and extensive teacher-licensure reporting requirements)

- It is frequently impossible to distinguish L21 efforts from PKAL efforts

- Not all implementations require large-scale monetary investments – some culture change has occurred to move from mentality of “needing reassigned time” to make things happen to “working within the system” to achieve desired goals

- Interdisciplinary courses and extra-curricular programming are continually under development toward connecting science to other disciplines (“Does Science Matter”, Library Athenaeum series, River Studies, Residential College themes, etc.); many of these initiatives supported by L21 or other university structures
Faculty are engaging in new ways, such as “common office hours”, which also create further opportunities for interdisciplinary collaboration

**Photo Gallery and Miscellanea**

Teaching students the real meaning of “pressure” through constructivist, extreme hands-on methods. Such demonstrations take real trust between faculty, and the students never forget the eventual lessons.

Question for the interested reader: Why is it important that Andy Ferstl be placed “correctly” on the bed of nails for this demonstration?

The power to convene.

“Science for All”
San Antonio
February 2006

College of Science & Engineering Spring Symposium 2006