Assessment for Learning (AfL) Education Research Scholars:
Capacity Building in Mathematics & Science Education

Western Michigan University (WMU) seeks funding in the STEM Education Research Scholars subcategory of Capacity Building for K-12 Discovery Research. WMU's project represents a potent collaboration between three nationally recognized programs: the Evaluation Center, Mathematics Education, and the Mallinson Institute for Science Education (MISE). The proposed capacity building project expands on research in assessment for learning (AfL), or "the process of seeking and interpreting evidence for use by learners and their teachers to decide where the learners are in their learning, where they need to go and how best to get there" (Assessment Reform Group, 2002). **One goal** of WMU's project is to bring faculty from all three programs together in a formal cluster, or learning community, to foster the development of research and leadership in evaluation and, specifically, AfL. The **second goal**, which grows from and will draw on the first goal, is to recruit a cadre of five STEM Education Research Scholars into the learning community as doctoral students who will be trained in and conduct research on measurement and evaluation. Each collaborating WMU program has a well-established strand of research, of which STEM classroom assessment is a major area of interest. An area of commonality for the doctoral research projects will be to advance the profession's understanding of the sort of evaluation preparation needed for STEM teachers to effectively use assessment tools. The **third goal,** which will be an outcome of the first two goals, is to expose preservice teachers to assessment models in their STEM coursework, providing them from the start with a natural appreciation and understanding of assessment theory and practice. Exposure to the role assessment plays in both progress and student motivation in STEM classes will in turn stimulate these new teachers to use sound assessment practices once they enter the classroom. *The project goals address both DR K-12 Grand Challenges 1 and 2. First, the research conducted will result in better STEM teacher-training models and tools. Second, the project will increase future teacher education capacity, in that future STEM teachers will be better able to increase student learning by being well grounded in the theoretical basis for and practical application of AfL.*

Intellectual Merit. In spite of an acute professional awareness of a need to institute new forms of assessment as a way to improve learning and retention in STEM, research consistently indicates that teachers do not fully exploit the rich potential of using multiple forms of assessment. The AfL project will spark a change in practice by building capacity for developing and studying the impact of STEM K-12 assessment-for-learning practices, improving assessment in K-12 STEM and college level teacher preparation courses, and by providing models for preservice preparation of STEM teachers through development and study of enhanced teaching modules focusing on assessment practices.

Broader Impacts. The project will integrate doctoral programs across STEM and evaluation faculty and disciplines, provide new tools for STEM classroom assessments, and improve STEM teacher preparation. The tools and research findings will reshape teacher preparation programs and increase STEM achievement in K-12 schools. Improving assessment practices is most promising and effective for the most vulnerable student groups: minorities, low achievers, and those at risk of dropping out. Results will be disseminated in national presentations, textbooks, journals, and through the University's extensive Web system. Dissemination of findings will stress improvements in STEM classroom texts, STEM testing, STEM teacher preparation texts, and accreditation requirements for teacher training in STEM areas.