

Northern Kentucky Algebra Community

Project Description, Summer 2009, Fall 2009, Spring 2010

Project 1 Activities: The activities that constitute this project occur in five phases:

- (1) Background Phase (3 days, Spring 2009): In this phase, two undergraduate students and two to four High School teachers will become acquainted with Smith's model of algebraic rigor, Hodgson and Hasenbank's discussion on procedures with connections (level (3) of Smith's model), and research related to the teaching and learning of algebra.
- (2) Curriculum Development Phase (5 days, Summer 2009): This phase will focus on the identification of rigor in tasks, the identification of appropriate units to redesign, the incorporation of rigorous tasks within these units, and the design of assessments to measure the impact of the redesigned units. The teachers, NKU Math Educators, and students will design items to measure students' conceptual understanding and procedural performance, as well as rubrics to assess fidelity of instruction.
- (3) Instruction and Data Collection Phase (15 days, Fall 2009): Using instructional units that were designed during Phase 2, the teachers will implement rigorous algebraic activities in the classroom. *Upon approval by the NKU Institutional Review Board*, the NKU Math Educators and students will observe selected classes to establish the fidelity of instruction (i.e., Have the teachers actually increased the rigor of their instructional tasks?) and assist with data collection. Data consist of students' responses to conceptual, procedural, and problem-solving items, assessments of instructional fidelity, and teacher interviews. Common assessments will be administered to treatment and control classes to gauge the

impact of rigorous activities (as compared to a standard instructional approach). Further, KDE's videography services will be invited to obtain video of exemplary instruction, based on rigorous algebra instruction.

- (4) Analysis Phase (3 days, Fall 2009): The students and NKU Math Educators will analyze the data that are collected, with a particular emphasis on students' conceptual understanding and procedural performance.
- (5) Dissemination Phase (Spring 2010): Developed lessons and ancillary materials will be disseminated through the NKAC's website at www.nkyalgebra.org. Also, exemplary instructional videos will be extracted and presented to area teachers as models of algebra instruction.