Understanding Math Classroom Affordances of Networked, Hand-Held Devices

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Summary of Merit Review and Recommendation

This proposal seeks to combine established representational innovations in mathematics with increasingly ubiquitous hand-held devices and to investigate the impact of this combination on typical classrooms. The PIs argue that inexpensive, interactive and reliable classroom connectivity can unleash the long-unrealized potential of computational media in education, since the effects of that connectivity are direct and at the communicative center of everyday classroom teaching and learning. Furthermore, these effects must be sufficiently understood to inform the iterative improvement of technologies and classroom practices that support learning and the design of teacher development and support structures.

Panelists were uniformly positive about this proposal and identified many strengths. The timing of the technology was cited as a strength since the technologies to be employed were close to becoming available in the mass market. The price of some the technologies is rapidly decreasing, thus enabling broadened access and affordability. Reviewers also liked the fact that there was a complementary proposal submitted to the Interagency Education Research Initiative that, if funded, would enhance this work. Another compelling aspect of the project was its potential to have significant impact on the education of traditionally underserved groups. In investigating new forms of pedagogy enabled by the networked wireless technology, the project holds potential for engaging broader segments of the population.

The appropriateness of NSF support was examined by the reviewers. The panel deemed this work important to support since it examines a category of technology that has the potential to substantially reorganize the classroom learning environment. [*Note*: Proposals viewed as inappropriate for support include technology development as an add-on or enhancement to existing classroom structures where it is not integrated into

changing the teaching and learning setting and/or where broader research implications are not clear.]

The panel felt that this proposal was worthy of support. The program officer concurred with the panel recommendation. Subsequent discussions among NSF staff did raise several additional points: (1) the formation of an advisory board, (2) NSF review of the teacher and classroom selection for the purposes of the proposed design experiments, (3) and the boundary between "product usability" questions that seem more germane to the needs of the technology partners than to the research aims of the project.   These were communicated to and addressed by the principal investigator.