**Activities and Findings of CPATH Planning Grant: Building A Community to Revitalize Community College Undergraduate Computing Pathways**

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The intent of this project is to assist in the revitalization of undergraduate computing education. This work concentrates on barriers community college students frequently encounter when attempting to complete mathematics requirements for transfer to a four institution, when a bachelor's degree in computing science is the desired outcome.

Project activities in this reporting period centered on research and analysis of innovative models, and pilot project design. A primary question emerged almost immediately: How best to support and encourage a tech savvy learner in mathematics? Participants acknowledged from their own experience that community college math instruction is largely disconnected from web based resources. Building on the learner's high level

of confidence in technology, instructors in this project seek to explain math concepts and provide mentoring within the students digital comfort zone, by leveraging social networking and gaming elements to facilitate math mentoring.

COLLABORATION WITH NSF (ATE) STEM TO STERN GRANT (NSF DUE #0703026)

The intersecting goals of the CPath and STEM to Stern projects provide opportunity for mutual enhancement. A subset of STEM to Stern's target learners are ideal for internships, mentoring and enhanced support through CPath pilot projects. While the two grants pursue highly differentiated goals from one another, the principal investigators meet frequently to benefit from research and lessons realized in their separate efforts.

PILOT DESIGN

All three community colleges in this partnership will launch a pilot project, one academic quarter in duration. Bellevue Community College's pilot is scheduled for Fall, 2008. The remaining two pilot projects will be undertaken Winter, 2009. Each college will select one math class for the pilot. Students in those classes will be made aware of the virtual math mentoring and activities through early and comprehensive outreach efforts. Math instructors will offer extra credit for learners who investigate and use virtual mentoring, and engage in related web-based activities supporting class content. They will advocate for student participation through the syllabus, in the classroom, and on the class website. Computing science instructors will encourage students in the same way.

Pilot impact assessment will be tracked during the events, and may include participation; frequency of participation; degrees of interaction; type of support selected; persistence in virtual mentoring; persistence in class; persistence in computer science class. Student, mentor, and faculty surveys will augment these data.

Institutions have drafted individual pilot project designs. These concepts will be discussed and vetted by all grant partners to ensure a uniform purpose and optimal interface with the primary electronic repository (the Student Initiated Social Learning Network). The overall goal of the pilot design is to inspire technology adept learners to experience math in a new way. This approach recasts mathematics pedagogy with digital strategies, creating an enlivening, familiar atmosphere for students with an affinity for computing.

STUDENT INITIATED SOCIAL LEARNING NETWORK (SISLN)

Students at the University of Washington, Bothell, have examined elements of successful persistence by learners pursuing a baccalaureate degree in computer science by interviewing students in computing classes and examining their own history in lower division mathematics course work. Additionally, they are working on a project focusing on core math competencies required for a bachelor's degree in computer

science. These students are creating a repository for bringing core math concepts to life, using multiple approaches to meet differing learning styles.

Students, in collaboration with grant partners, have identified core mathematics competencies, essential for success in computer science learning. These elements comprise the heart of this web based math mentoring tool. Its design is led by consideration of relevance to computer science course requirements, real life interaction with computing scenarios, and problem-focused math learning.

**Findings:**

The revitalization of community college undergraduate computing pathways entails focus on each footfall in the learner's experience. The focus of this planning grant is prevention of students from faltering while attempting to complete math requirements on the road to a bachelor's degree in computing science. Findings, thus far, indicate grant participants might concentrate to good effect on elements of the Web 2.0 culture in which

learners are already engaged. In addition to meeting math learners where they (digitally) live, fundamental elements of social and learning support must be included for successful way finding.

**INNOVATIVE MODEL RESEARCH**

A formal review of relevant literature was undertaken by University of Washington librarians. A parallel effort was made by grant partners. The results of both research initiatives generally pointed to similar conclusions. Academic success in science, math and engineering is notably correlated with the following factors:

1) formation of intentional communities of learners

2) enhanced advising

3) programmatic structure

4) classroom 'climate'

5) integrated curriculum design and delivery

6) social support

7) mentoring (peer to peer; four year students to two year students; faculty to students)

Additionally, participating community college faculty members agree that math requirements are the primary stumbling block for learners intending to transfer to a four year institution to complete a degree in computer science. The group decided to concentrate on designing pilot projects to assist those students.