

Students' Pathways into Computer and Information Sciences Majors: A Study of Community College Students



Jill Denner, ETR Associates
Linda Werner, University of California, Santa Cruz

Abstract

Women's enrollment in computer and information sciences (CIS) majors and completion of CIS undergraduate and graduate degrees has declined in the US over the last 20 years (National Science Board, 2006). Efforts to reverse this trend have been limited by a lack of research on pathways into and out of community college CIS classes.

Community colleges are of interest because they attract a higher proportion of females and a broader demographic in terms of age and socioeconomic status than 4-year universities (National Center for Education Statistics, 2007). But previous studies of community colleges are limited; few are longitudinal; most lack theory; are primarily descriptive; ignore variation within gender; focus on individual not relational factors, and are not recent enough to account for the current era of pervasive technology use (Singh, Allen, Scheckler, & Darlington, 2007).

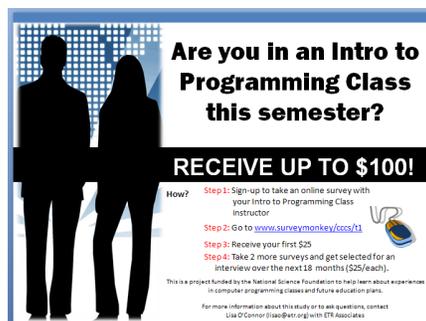
This longitudinal study is designed to overcome these limitations and to collect data that can be used to inform efforts to reverse the decline in CIS majors. We draw on theoretical frameworks that suggest the importance of motivation (Eccles, 1994), parent and peer support (Bleeker & Jacobs, 2004; Tiedemann, 2000), and previous computer use (Burger, Creamer, & Meszaros, 2007) and specifically computer game play (Cassell & Jenkins, 1998; Tillberg & Cohoon, 2005).

Data will be collected from 700 female and male students in introductory programming courses at community colleges that are key feeder schools to the University of California (4-year public universities) CIS departments.

Research Questions

1. *What individual factors explain students' plans to pursue a CIS major?*
2. *What are the unique contributions of motivational factors, familial factors and previous computer use in predicting whether community college students who are interested in computer science will pursue a CIS major at a 4-year university?*
3. *Is there a significant difference between female and male students in the factors that explain pursuit of CIS major?*

Participant Recruitment Flyers



Data Collection

Online surveys will be collected by Survey Monkey at three points over two years.

One-on-one interviews will be conducted over the phone or in person.



SurveyMonkey.com
because knowledge is everything

Collaborating Colleges



Project Timeline

2010

January-July : Recruit colleges, finalize survey and interview questions, get IRB approval

August-Dec: Time 1 data collection and data cleaning

2011

January-April: Data analysis, participant tracking

May-June : Time 2 data collection

July-December: Data cleaning and analyses, submit conference presentation

2012

January-April: Participant tracking

May-June : Time 3 data collection, Student interviews

July-December: Data cleaning and analyses, dissemination

Survey Constructs

Motivational Factors

- Value Placed on Computing
- Expectations for Success with Computing
- Future priorities

Familial Factors

- Family Support
- Parent Occupation
- Education of Maternal and Paternal Figure(s)

Computer Use

- Digital Gaming Interest and Experience
- Computer Use in Childhood and Now

Other Constructs:

- Perceptions of Racism/Sexism
- Faculty-Student Interactions
- Interactions with Other Students

Dependent Variable:

- **Future Plans to Pursue Computing**

Contact information

Principal Investigator: Jill Denner, PhD
jilld@etr.org

Co-Principal Investigator: Linda Werner, PhD
linda@soe.ucsc.edu

Project Coordinator: Lisa O'Connor lisao@etr.org