The girls creating games program: Strategies for engaging middle-school girls in information technology.

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The Girls Creating Games Program: Strategies for Engaging Middle-School Girls in Information Technology

Jill Denner, Linda Werner, Steve Bean, Shannon Campe

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In lieu of an abstract, here is a brief excerpt of the content:

The Girls Creating Games Program:
Strategies for Engaging Middle-School Girls in Information Technology

Jill Denner (bio), Linda Werner (bio), Steve Bean (bio), and Shannon

There is a clear need to increase girls' leadership in technology. The number of female undergraduates in computer science declined from 37 percent in 1984 to 27 percent in 1997.[1] Females make up only 20 percent of high school students who take the advanced placement test in computer science.[2] Hispanic females make up the smallest percentage of any group, comprising only 1 percent of all computer science AP test takers in 1999.[3] These statistics show the need for interventions that can increase the interest and ability of female students to persist in computer science classes, and ultimately in computer technology-related careers.

In this paper, we describe Girls Creating Games (GCG), an after-school and summer program for sixth- through eighth-grade girls designed to address the barriers to girls' active participation in information technology (IT). As others have done in coed settings,[4] we put girls in the role of designer by teaching them to program an interactive computer game.

Gender, Games, and Technology

The program focuses on computer game development for two reasons. First, computer games are considered a gateway to more active use of technology. Not playing games disposes girls to relatively less active roles with the computer and delays improvement of spatial and problem-solving skills.[5] The second reason for teaching game design and production is that it puts girls in the role of technology leaders, which can break down personal identity barriers as well as external barriers, such as gender role stereotyping and discrimination. By creating a game, the girls express and work through concerns about social issues and identity.

The program strategies also build on research about how girls relate to technology. Females are more likely to see the computer as a potential tool to improve the world, whereas males are more likely to

think of the computer as **[End Page 90]** something to help them master their environment.[6] Female students have less confidence than men in computer science, take fewer chances that might push technology into new realms, and are more likely to blame themselves if they do not understand something.[7]

Barriers and Supports for Women in Technology

Educators need to overcome several barriers to increase girls' active participation in technology. Personal barriers include lack of self-confidence, lack of fluency in technology skills, lack of early positive experiences, lack of information about careers, and a belief that technology careers require a solitary lifestyle in front of a computer.[8] Social barriers include lack of support or encouragement from family, peers, or school personnel; gender role expectations about girls' role in technology; lack of female role models; and lack of access to computers because boys dominate available resources.[9] Structural barriers include software and programming manuals written by and for males, girls' dislike of narrowly and technically focused programming classes, a perception that the field lacks social relevance, and instructional methods that prevent girls from becoming technical problem-solvers.[10]

Research provides some clues as to how to overcome these barriers and increase the numbers of women and girls in IT. One study found that female university students who persist in computer science have peer support, experience success in some aspect of computing, see computers as useful for expression, and reject the stereotype of the computer geek.[11] Other studies have found that women who persist see the intrinsic value of computers.[12] Learning and working in pairs on the computer is also related to retention in computer science courses.[13]

Middle school is a critical time for intervention, when girls actively begin to explore identities, interests, and talents, and make initial decisions that affect the pathway to participation in IT. In middle school, girls decide about what kinds of classes are consistent with their relationships and identities, and these early decisions affect enrollment in computer

classes in high school.[14] The strategies and objectives of the Girls Creating Games program, described below, are designed to address the personal, social, and structural barriers to active IT participation that face young girls.

Methods

Our...

The Girls Creating Games Program

Strategies for Engaging Middle-School Girls in Information Technology

JILL DENNER, LINDA WERNER, STEVE BEAN,

AND SHANNON CAMPE

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