Chapter 42
Minecraft Server Project:
Designing Synchronous Blended Learning Environments to Support Distributed Mentorship

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ABSTRACT

Opportunities to participate in computing-related informal programs are limited in terms of quantity and geographic distribution. This limitation is due, in part, to the dearth of adults who have the expertise to mentor youth on computational concepts. This chapter introduces the Digital Youth Network Minecraft Server Project, which aims to reduce the barriers to for non-expert adults to be able to provide informal, computing-related learning opportunities to diverse youth. Using Minecraft, an online multiplayer game, the authors investigate a blended approach to mentorship that diversifies who can lead informal computing opportunities. This study examines learner-mentor interactions in a Synchronous Blended Learning Environment (SBLE) focused on engaging African American and Latina middle school girls in computer science. The chapter concludes with design recommendations for SBLEs to better support the needs of mentors facilitating computing opportunities for African American and Latina middle-school girls.

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INTRODUCTION

Relationships matter when designing inviting computing communities for underrepresented youth. The ability to relate to peers and mentors is an essential factor that underrepresented youth consider when deciding whether to enter and stay in computing communities (Margolis & Fisher, 2003; Margolis, Estrella, Goode, Holme, & Nao, 2010). The work of the Computer Clubhouse (Resnick & Rusk, 1996) and the Digital Youth Network (Barron, Gomez, Pinkard, & Martin, 2014) demonstrate two highly successful models that engage underrepresented youth in computing communities. Both organizations have fostered inviting computing communities by:

1. Creating an environment that is filled with the latest technology;
2. Staffing the environment with content mentors and teaching artists that can relate to youth socially but also serve as role models;
3. Embedding the computing content within the context of youth culture (e.g., video games, movie making, animation); and
4. Centering the community in a location that is easily accessible for the target audience.

However, despite the lessons learned from these computing community exemplars, we have not necessarily figured out how to adapt these models to local contexts.

To illustrate the challenge applying these ideas locally, consider this scenario: Ms. Smith, an African American teacher on the Southside of Chicago wants to create a computing community that caters to the students in her neighborhood. Ms. Smith has the commitment and deep personal relationships with her students to bring them into a computing environment, but she does not possess the money to purchase the latest technologies. Neither does she have the technical expertise to create compelling computing content that appeals to students and teaches key computing concepts. She is unable to provide a program that she knows her students need to successfully navigate the global knowledge-economy that awaits them.

We know that Ms. Smith is not alone. Looking at the diversity of those who are currently in computing careers, the number of women and minorities is low. In 2010, women received only 18% of all undergraduate engineering degrees even though women received 64% of undergraduate degrees in overall. That same year, African Americans and Latinos combined only made up 12% of the graduates who received undergraduate engineering degrees (NSF, 2013). This means that there is a lack of role models that female and minority youth can identify with when it comes to computer science, which influences perceptions of who belongs and who can be successful in computing (Cheryan, Plaut, Davies, & Steele, 2009). If the goal is to transition students of color from being consumers of technology to being producers of technology, then we must change perceptions about who does computing. To change perceptions and increase diversity within computing, we must find ways of broadening who can support, lead, and design learning environments that invite and engage underrepresented youth in computational learning.

To expand who can lead computational learning experiences, we advocate a distributed approach to mentorship that is facilitated by technology. In the distributed approach, adult mentors with complementary skills and expertise in computation, youth mentorship, and community awareness are brought together to form a mentorship team. As a unit, the team contains all the necessary skill, expertise, and experiences to foster inviting and rigorous computational learning experiences for diverse youth. The