Chapter 15

Using Game Design as a Means to Make Computer Science Accessible to Adolescents

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EXECUTIVE SUMMARY

In this case, the author discusses using game design and community-building as methods for increasing interest and knowledge of computer science for students from underrepresented populations. Students in a six-week Upward Bound Math and Science (UBMS) summer program learned game design alongside programming basics, while they spoke to programming industry experts. For four weeks, students focused on the design concepts in different games they had played and with which they were familiar. They recreated these games by programming them using MIT's Scratch software. In the remaining two weeks, students created their own game using the concepts and skills they had learned. Some students chose to program their games to use the Xbox 360® Kinect™ controller as a way for the player to interact with their game using their whole body. Programmers spoke to the students weekly, both online and in person, answering questions about the field and the work that they do. Students shared their work with one another and the instructors in a Virtual Learning Environment (VLE).

ORGANIZATION BACKGROUND

The Chicago Teachers' Center at Northeastern Illinois University (CTC@NEIU) is a division of the College of Education. CTC@NEIU has worked to improve urban education through collaborative partnerships with K-12 schools, universities, and arts and community organizations since 1978. CTC@NEIU's 80 full-time and 200 part-time professionals have extensive expertise in working with all of the stakeholders that make up a school community, including students, teachers, parents, administrators, and staff from community agencies, universities, arts and cultural organizations, and businesses. CTC@NEIU's work to improve outcomes for K - 12 students is funded by various federal, state, and private grants. Northeastern Illinois University is the only four-year public Hispanic-Serving Institution (HSI) in the Midwest, and is ranked top both for being the most ethnically diverse university and for having students with the least amount of debt upon graduation in the Midwest region according to *U.S. News & World Report's* Best Colleges (2011).

SETTING THE STAGE

Though CTC@NEIU is composed of various grant-funded programs, these programs are united by a common vision of (1) increasing access to education, (2) building learning communities, and (3) transforming education practices. All CTC@NEIU programs, including the UBMS program, see computational literacy and the effective implementation of technology in educational practices as instrumental in accomplishing this vision.

As Director of Math, Science, and Technology at CTC@NEIU, I am charged with increasing interest in knowledge of science, technology, engineering and math (STEM) among the students with whom we work. At CTC@NEIU, we reach out to Chicagoland area middle and high schools in communities with high percentages of low socioeconomic status and underrepresented minorities. As Chicago grows as a technology hub, my research interest is how to increase interest and knowledge in computational fields to provide more opportunities for our students.

CASE DESCRIPTION

Because of my role to promote STEM at CTC@NEIU, I belong to various educational technology organizations, including Adobe Education Leaders (AEL). It was through the AEL program that I met an assistant principal who taught at a large

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