The Effect of Program Cost on Minority Student Virtual Computing Outreach Participation

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ABSTRACT

A Historically Black College or University (HBCU) hosted a virtual supplemental learning program to expose underrepresented minority and low-income youth to game development via Construct 3: Game Making Software. The program implemented a hybrid need-based admissions model that compared paid, subsidized, and free virtual outreach participation among underrepresented minority (URM) and low-income adolescents. Due to the program's unique distinctions: a virtual learning environment amid COVID-19, African American undergraduate instructors, and its need-based admissions model, it is unclear which factors directly affected student participation. Future directions include investigating what factors contributed to participation rates, obtaining student and parent feedback, and comparing this program to summer programs for underrepresented students.

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1 BARRIERS TO COMPUTING

Underrepresented minorities (URM) and low-income students experience inequitable access to computing education [2]. These populations face many systemic barriers including the high costs of CS education, lack of role models, unwelcoming learning environments, stereotypes, and the lack of access to CS education [1, 2]. Additionally, Black and Hispanic students, students receiving free and reduced lunch, and students from rural areas are less likely to attend a school that provides access to this critical subject [2, 3].

2 PROGRAM OVERVIEW

A private HBCU hosted a game development supplemental learning program that targeted adolescents, including those from underrepresented communities. The program had three distinct characteristics: 1. African American undergraduate students served as instructors and mentors. 2. A need-based admissions model. 3. It was held virtually amid Covid-19. In this report, we compare paid, subsidized, and free virtual outreach participation among URM and low-income students in a virtual supplemental learning program. Students learned Construct 3, a 2D game engine that can be used to design and create games, such as puzzles, platformers, and racing games.

3 METHODS

The program flyer was disseminated virtually via social media and email. The academy was a 7-week program offered to 6-9th grade students on Saturday mornings, afternoons, and evenings during Fall 2020. Daily schedules included two hours of live instruction and one hour of self-directed game development. Parents were required to select one of three household income ranges: $0 - $39,999, $40,000 - $84,999, and $85,000 and up, to determine whether the students would receive full scholarships, subsidized scholarships, or pay in full.

4 RESULTS

In total, 44 participants were admitted into the Academy. Of those admitted, 20% were not on scholarship, 25% received subsidized scholarships, and 55% of the applicants received full scholarships. Of the students on full scholarship, 41.67% had three absences or more, 27% of those on partial scholarship had three or more absences, and 33.33 from the full tuition group had three absences or more. The attrition rates of the groups are as follows: 33% for the full scholarship group, 45% for the subsidized group, and 33% for the full tuition group. Certifications were assigned based on attendance and game completion.

5 DISCUSSION AND CONCLUSION

Due to the program's unique distinctions, it is difficult to determine which of the program's features affected student participation. Results from this program indicate that short free weekend computing programs are not the overall solution to sustaining and motivating URM and low-income students in computing education. Future work includes investigating what factors contributed to low participation, obtaining student feedback, comparing this program to other summer programs for underrepresented populations, in addition to acquiring parent feedback on the model.

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