Board 213: Building an AI Certificate and a Computing Identity: Broadening Participation in Computing and Artificial Intelligence at a Hispanic-serving Community College

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1. Introduction

The development of the computing field creates a need for a robust and skilled computing workforce. However, there is a lack of postsecondary students in computing majors or disciplines. This project, funded by the NSF DUE/HSI Program seeks to develop artificial intelligence (AI) courses and an interdisciplinary certificate that will expose community college (CC) students to AI and lead to the development of a degree program in AI. The project seeks to enhance Hispanic-Serving community college (HSCC) capacity to interest and train students in AI. This four-year project is a collaboration between a CC, a university, a non-profit organization, industry partners, evaluators, and social scientists to understand how to expand HSCC computing pathways.

2. Program Details

The main objectives for the project include developing and implementing an interdisciplinary AI certificate at the HSCC and, subsequently, creating courses that could be incorporated into a four-year degree at the HSCC. The interdisciplinary AI HSCC Certificate has four courses: AI Thinking, Applied AI in Business, AI & Ethics, and Machine Learning Foundations. Other objectives for the project include providing professional development opportunities for students and faculty, such as guest speakers and seminars, AI bootcamps, and completing the AI4ALL Discover AI certificate, to learn more about the concepts and applications of AI. Additionally, the team aims to complete an evaluation on partnerships between CCs, universities, and industry partners, and conduct a computing identity study, which is the focus of the role of the research team.

3. Research Project Details

As a continuation of the project, the research team employed a phenomenological study, informed by computing identity development theory [1], [2] and Hispanic-Servingness frameworks [3], to conduct semi-structured interviews to learn about the students' development. Thus far, the team has interviewed 19 students from a range of majors (i.e., data analytics, cybersecurity, and philosophy) and various background demographics (i.e., race, ethnicity, age, income, education-level). The research team coded participant interviews using a codebook developed from the computing identity development and Hispanic-servingness frameworks and used analytical memos to summarize and highlight salient experiences and identities of the participants and their development.

4. Findings from Year 2-3

From the research process, the team synthesized and published findings focused on groups of students within our sample: Latinx students, Latina students, and students who work.

4.1 Latinx Students

Students pursued computing coursework and/or the AI certificate for many reasons. A portion of the students mentioned that the AI Thinking course was offered for free by the HSCC through a scholarship program, which motivated the students to sign-up for the opportunity. The research team explored the cost aspect of the course by looking at a specific subset of students within the participant pool that mentioned the cost of the course in their interviews [4]. One of the major findings from this work was that the students decided to pursue the course because it provided the opportunity to build their computing interests and pivot to a different field or discipline. Another major finding was the lack of mention of Hispanic-servingness structures such as the mission, values, or engagement with the Latinx community in their experiences in the HSCC certificate program.

4.2 Latina Students

With a specific focus on Latina students and their development of computing identities, the research team found that Latina students activated forms of aspirational and resistant capital to develop their computing identities [5]. Students looked to their futures as computing-engaged individuals to build resilience for the obstacles that they encountered and engaged in resistance against dominant norms which regard computing knowledge, skills, and careers as primarily for men. Latina students within this study also articulated several forms of intersectionality (e.g. sexism, racism, classism) which influenced their computing identity experiences at the HSCC.

4.3 Students who Work

In addition, there was a large subset (n= 11) of the participants in the study that held full-time or part-time employment positions across all the students (n=19) the team has interviewed for the study thus far. Many of the students were inspired to pursue courses and the computing certificate for career advancement or re-skilling purposes. Students found applications for their new-found skills in computing, such as coding, in their current roles at their jobs and the roles or jobs that they strive for in the future [6]. Finally, throughout the coursework, students were often affirmed in their interests and provided opportunities to demonstrate knowledge from certificate course content through their roles at work. We found that students were recognized by their supervisors and coworkers as computing people.

5. Lessons Learned from Year 2-3

Throughout Year 2 and 3 of the project, the research team has defined a few lessons learned and implications which have helped in defining the next steps for the project. For Latinx students, we found that participating in the certificate program courses did lead to the development of their computing identity, and that the participants saw themselves as computing people. However, there were no connections to Hispanic-servingness in the participant interviews. Additionally, students we found that Latina students were forced to draw on aspirational and resistant capital to sustain their computing identity, despite the certificate being offered at an HSI. Finally, for student who work, we found that the certificate impacts participants' in-process careers and identity-building in place, in addition to their future career aspirations. In the next phase of the project, the team will continue to collect interview data from the students in the program. For the next round of data collection, the team will focus on recruiting and interviewing students specifically from computing and engineering disciplines at

the HSCC to understand more about their development and connections to the concepts in the courses through the lens of computing identity development. Additionally, the team would like to recruit additional Black and Latinx students for the study, to better understand their experiences as a HSCC. The team would also like to expand on investigating the experiences of students who work, specifically understanding the similarities and differences in the experiences of students who work either part-time or full-time, and how students apply the knowledge from their AI certificate coursework into their employment positions and tasks at work. An area of future work includes investigating the barriers to computing identity development and, finally, how to best incorporate Hispanic-servingness frameworks. The team would like to investigate how Hispanic-servingness may complement the constructs of the computing identity framework and provide a different lens to understand the experiences of HSCC students.

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