

Leveraging AI to Improve STEM Engagement for Black and Latine Youth

Aisha Cora

Department of Electrical and Computer Engineering, University of Washington, USA

Vicente Arroyos

AVELA - A Vision for Engineering Literacy & Access, USA

Liban Hussein

AVELA - A Vision for Engineering Literacy & Access, USA

Vikram Iyer

Department of Computer Science and Engineering, University of Washington, USA

R. Benjamin Shapiro

Department of Computer Science and Engineering, University of Washington, USA

Kyle Johnson

AVELA - A Vision for Engineering Literacy & Access, USA

Abstract

Recent studies have shown that pedagogical approaches like hands-on lessons, representative and near-peer mentoring, as well as culturally responsive teaching increase Science Technology Engineering and Math (STEM) engagement in classrooms, specifically those with underrepresented minority (URM) students. URM students interested in pursuing STEM show increased engagement and confidence from more holistic outreach programs, however there is a dearth of instructors who represent URM student identities who also have the necessary technical know-how. However, new AI tools based on Large Language Models (LLMs), like GPT-3.5, have been shown to increase the productivity of software developers, with the largest productivity gains being for non-experts. Therefore, we propose a study on the usability of LLMs as an educational tool for supporting instructors of various skill levels in both facilitating and scaling programming classes for URM students. We aim to evaluate the capacity for these AI tools to help reduce the digital divide by exploring the limitations, effectiveness, and potential hesitations URM communities may have with integrating LLMs into their classrooms. If LLMs can support, and/or help scale the number of, culturally responsive mentors capable of instructing programming courses, URM students in the US may be poised as one of the major beneficiaries of these new AI tools.