

Designing Computing Lessons about the Equity and Social Justice Impacts of Computing

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Abstract—A central component of equity pedagogies is supporting students to develop critical consciousness and critique the dominant society. Previously, computing research has investigated how students use computing for social change. Yet, few opportunities exist for students to examine and critique the technologies they are using and the impacts of those technologies on society. The ubiquity of technology (both visible and invisible) and the role it plays in the everyday lives of youth, give pressing importance to such critiques and the need for all students to learn about the equity and social justice impacts of computing. In this ongoing project, we are partnering with youth and teachers to design a series of computing lesson integrating computer science learning with opportunities to learn about and critique the impacts of computing on society. As new curricular elements are designed, they are being piloted with middle grades students (6th grade; 11-12 years old) who identify as being from populations historically excluded from computing, a population that is also most likely to be surveilled by and fall victim to the biases of technology. This study will provide insight into design practices for developing effective lessons about the impacts of computing as well as the experiences of teachers and students learning about these impacts. This work contributes to the fields' understanding of teaching middle grade learners about the social justice impacts of computing and design elements supportive to both students and teachers when bringing these important topics into the classroom.

Keywords—*impacts of computing; Techquity; computer science education*

I. INTRODUCTION

Equity pedagogies promote not only cultural relevance, but also the development of students' critical consciousness by allowing students to examine and critique societal norms [1]. Past computing projects have developed this critical consciousness and promoted computing for social change through app development, video game development, and interactive storytelling [2]–[4]. Yet, the majority of such projects have focused on critiquing the prejudices and biases of society as a whole, but not specifically the technologies affecting the lives of youth and their communities. In our work, we are using participatory design techniques [5] to partner with youth and teachers to develop classroom materials with the explicit goal of providing students with computing opportunities that also critique the aspects of computing and technologies that cause or could cause inequalities, especially inequality based on membership within a marginalized population, which we refer to as *Threats to Techquity*. In this poster, we present preliminary analysis of the design work and an initial versions of our Techquity curricular materials.

II. ENGAGEMENT GOAL

We hope to engage with the RESPECT community to share our curricular materials as well as to receive feedback on the current pilot study of the curriculum and the in-progress data analysis. Sharing our work with the community will provide valuable insights and allow us to make connections with others who are doing or considering similar work.

III. PROJECT TYPE AND PHASE

This project is an ongoing empirical design study focused on using participatory design techniques to develop new curricular materials as well as study the use of those materials within classrooms. This poster will present two aspects of our work. First, it will present the completed curricular materials based on the collaborative design work with teachers and youth. Second, it will present preliminary analysis of data from the design sessions as well as from the pilot study.

IV. RELEVANCE TO RESPECT

This work focuses on both (1) broadening participation in computing by developing and implementing computing lessons with and for students from populations historically excluded from computing and (2) teaching students about the equity and social justice impacts of computing on them and their communities. This work builds on research from the RESPECT community focused on supporting students to critique societal norms and use computing for social change by providing such opportunities specifically within the realm of examining technological biases the ways design processes encode the biases of developers and data within their technologies.

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