Designing a serious game promoting social justice in the technological development for underserved communities

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As technology rapidly evolves, its impact on society intensifies, while underserved communities suffer from inequity in access to these technological resources. Humanitarian engineering (HE) aims to address these disparities by developing technologies that benefit all communities. However, traditional engineering education often lacks emphasis on the social implications of technological solutions, leading to a gap in students' understanding of social justice issues. To bridge this gap, the HE group at the University of Twente (UT) proposed serious games as educational tools to provide meaningful experiential learning opportunities to students.

The goal of the assignment is to use serious games to enhance students' understanding of social justice in technological development for underserved communities. Well-designed serious games can offer an engaging and interactive way to teach complex concepts of social justice, making education more impactful and relevant to real-world challenges. To achieve this, research is conducted to define effective strategies for integrating social justice into serious games and to identify how these games can deliver impactful educational experiences to students. Therefore, the research seeks an answer to the following main research question:

How can a serious game be designed to deliver impactful educational experiences while emphasizing the importance of integrating social justice principles into technological development for underserved communities?

The research combines literature reviews, stakeholder interviews, and iterative game design to develop a serious game called "Project: Rivertown." Literature reviews explore several central and sub questions related to game design, social justice principles in technological development, games' educational effectiveness, challenges in game design, and lessons from real-world humanitarian projects. Stakeholder interviews are conducted with members of the HE group at UT to supplement literature reviews. Finally, the game "Project: Rivertown" is developed based on the requirements, which are formulated by considering the insights from these literature reviews and interviews. This 2D top-down RPG (role-playing game), developed in Unity, places players in the role of an engineer tasked with solving a conflict over technology between a community affected by it and a community that develops it. The game integrates key social

justice principles, such as participation and fairness, into its narrative and mechanics, providing an immersive educational experience.

Image 1: The serious game “Project: Rivertown”

The game successfully integrates social justice principles, enabling students to understand the importance of balanced perspectives and community participation in technological development. Players engage with community members to gather required information for their solutions and make decisions that impact the game’s result, fostering cognitive (knowledge acquisition), relational (understand community dynamics), and normative (reflect on the outcomes of players’ decisions) learning outcomes.

In conclusion, the serious game “Project: Rivertown” is developed by integrating social justice principles to deliver meaningful educational experiences, emphasizing social justice in technological development for underserved communities. To achieve this, the game incorporates diverse perspectives and addresses real-world challenges. The game can provide valuable insights into the importance of integrating social justice into engineering solutions, helping students understand the broader impact of their work. Nevertheless, there are several recommendations for further improvement of the game. Currently, the game lacks racial diversity among its characters. This can be improved by including characters of various skin colors and ethnic backgrounds, thereby providing a more inclusive representation and better aligning the game with the theme of social justice.

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