Using Roblox and VR to Inspire Game Development Skills and STEM Interest

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Introduction

This study investigates using Roblox Studio to introduce middle school students to game development and programming concepts in an engaging, interactive manner. We build our project during our Technology Ambassadors Program (TAP) course we are enrolled in Fall 2023.

The Technology Ambassadors Program (TAP) at Georgia Gwinnett College (GGC) provides mentoring and hands-on technology projects for IT students. TAP is a service-learning initiative that empowers IT students to mentor, collaborate on technology projects, host workshops, participate in conferences, and engage in community outreach. TAP teams collaborate with faculty members to develop cutting-edge projects involving emerging technologies. It provides students with invaluable experience, enhances their technical skills, and fosters communication, teamwork, and leadership abilities.

This project aligns with TAP's mission to enhance technical skills and serve the local community. Related works [1,2] have examined using game engines and virtual worlds for educational purposes. In a world increasingly driven by technology, inspiring a new generation of innovative thinkers and creators is paramount. Our study is motivated by the need to provide students with hands-on experiences that combine game development, VR technology, and programming skills. By doing so, we aim to ignite the spark of curiosity and creativity in young minds, fostering their interest in STEM and game development.

Methods

Previous research [1] has demonstrated the effectiveness of immersive and interactive learning experiences in enhancing student engagement and understanding. Our project builds upon this foundation by uniquely integrating game development and VR technologies into STEM education. We leverage the Roblox Studio game engine and Lua programming language to create educational games that are both entertaining and instructive.

Our project addresses the pressing need for innovative and engaging STEM education by offering two interactive and educational games developed using the Roblox Studio game engine - a VR demo game and an obstacle course with interactive elements. The first game, designed for the Meta Quest 2 VR headset, serves as a captivating demonstration of VR game development. The second game is an obstacle course hosted in Roblox Studio, where players learn basic game development concepts by manipulating the game world and scripting game physics using the Lua programming language—all within the context of an exciting game. The obstacle course aims to teach basic programming and environment manipulation. The project aims to spark interest and increase diversity in STEM and game development careers through an unintimidating and fun introduction.

Results

We plan to showcase our project at several events to fulfill our outreach target of the TAP course. These events are: TAP Expo where the project will be showcased to GGC college students, Super Saturday

Series (S3) where the project will be showcased to middle school students, and 3 classroom workshops where the project will be showcased to General Education college students.

Workshop participants will learn game design principles and scripting using the Lua scripting language while playing and modifying the games. Assessment of the effectiveness of our outreach effort (engagement, learning, and interest in computer science) will be measured by analyzing the results of the pre and post surveys that we will administer during the workshop to collect insights from the participants. Results will be measured with the use of pre-event and post-event surveys which will also ask questions regarding the students' knowledge of basic programming concepts and game creation.

This study contributes hands-on game development experience to the TAP service learning curriculum and evaluates Roblox's potential for engaging the youth in programming and game development. Our study caters to young students, specifically those at the middle school level and below, seeking to explore the world of game development and STEM in an accessible and fun manner. Our project aims to demystify programming and technology, making it an unintimidating endeavor for our young participants. Our poster will showcase the project details and the outreach events soon to happen. It will also provide the results of our study.

Conclusions

Our project aims to make game development and STEM education fun and approachable for young students. We are driven by our passion for games and game development, and we believe that learning should be an interactive and enjoyable experience. TAP, through scholarships, presentations, and affiliations, strives to provide students with real-world experience, contribute to their community, build impressive resumes, and establish networks aligned with GGC's pillars of scholarship, leadership, service, and creativity.

In conclusion, our project within the Technology Ambassadors Program (TAP) is designed to inspire the next generation of game developers and STEM enthusiasts by combining game development, virtual reality, and programming in a fun and accessible manner. We aspire to empower young minds to dream, create, and innovate in the world of technology.

References

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