DEVELOPMENT OF A MOBILE AUGMENTED REALITY APPLICATION TO ENHANCE YOUTH ENGAGEMENT IN PLANNING AND DESIGNING PUBLIC SPACES IN URBAN AREAS.

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Urban planning necessitates public participation to ensure that every individual's voice and requirements are heard and considered, thereby promoting inclusive urban development. According to UN-Habitat (2018), public participation fosters a positive relationship between a government and the public by communicating effectively and solving conflicts collaboratively. Despite the theoretical emphasis on participatory planning in planning practices, research has identified a lack of community participation in planning-related contexts, leading to the current gap between urban planning and public participation. The incompatibility between communication preferences and the public's preferred method of engagement significantly contributed to the lack of public engagement in urban planning using traditional approaches [1]. Furthermore, in the local context, the existing participatory planning methodologies are outdated and fail to motivate people to voice their opinions. Given this situation, we hypothesize that incorporating advanced digital technology and an augmented reality application into a participatory planning methodology could enhance community involvement in planning and designing public spaces in cities based on their needs. Researchers and planning practitioners have tested the use of digital, immersive technology to enhance public participation with various applications in response to the growing interest in using immersive technologies such as virtual reality (VR), augmented reality (AR), and mixed reality (XR) for urban planning in a global context. The assumption is that the use of augmented reality can support quality assurance in planning processes [2]

2D Hand Sketching

3D Modelling (Sketchup Pro)

Research indicates that realistic visualisation tools and techniques are more effective than abstract representations, especially when it comes to engaging a non-specialist audience [3]. Augmented reality serves as a platform to identify the needs and problems of neighbourhoods due to its ability to integrate with the real-world environment realistically, providing an overview of the issues in the actual context [4]. More importantly, AR enhances and motivates youth and children's engagement in the planning process by helping their design proposals come to reality with an understanding of the planning context ([5]; [6]).

To test the "CityBuildAR" app with users, the University of Moratuwa conducted a pilot test.

Figure 1: City BuildAR Demonstration at Sentra Court, UOM

"City BuildAR" is a mobile augmented reality application that is under development and focused on planning and designing public spaces in urban environments. Once the app launches, users can install it on their mobile phones and design public spaces by arranging various objects provided as assets. We developed the 'CityBuildAR' app using the Unity 3D engine and AR toolkit. Depending on the type or category of the public space (park, playground, bus stop), the user can manipulate various objects and ultimately view the real-world situation through the AR app. Furthermore, this app incorporates gamified elements such as badges and progress bars to improve its users' urban planning education. For example, if the user adds more built-up spaces to the public space, it shows the ratio of green and built space required based on the guidelines, and if it exceeds the ratio, the user can see it on the app display. Users can publish their designs on the app platform, and planning practitioners can consider people's needs before designing a particular space. We conducted an initial demonstration at UOM with 25 urban planning undergraduates to identify their willingness to use AR in planning, and to test the efficiency and impact of the CityBuildAR app in engaging users in planning and design. We designed the university cafeteria (Sentra Court) area using pre-existing methods like 2D hand sketching, 3D modelling (Sketchup Pro), and the City BuildAR app, as illustrated in figure 1. According to the results, the majority of the participants, 83%, agreed that CityBuildAR is effective in the sense of handling and user friendliness, and all the participants, 100%, agreed that AR is effective in planning and designing public spaces from a user perspective. Only 66% of participants agreed that AR is a cost-effective tool to use.

In Sri Lanka, we can use mobile augmented reality as a participatory planning tool to bridge the existing gaps between urban planning and community participation. However, the availability of expertise in creating the AR platform and mobilizing within the community is critical to enhancing inclusivity in public participation.

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