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GAMIFYING SUSTAINABILITY: CREATING AN APP TO PROMOTE SDG PRACTICES AMONG STUDENTS

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ABSTRACT

Despite widespread awareness of the United Nations' Sustainable Development Goals (SDGs) among students, with 92% of surveyed students demonstrating familiarity, a disconnect remains between knowledge and consistent sustainable practices. This project addresses this gap through an innovative gamified mobile app designed to transform SDG education into an engaging, habit-forming experience. Building on survey results showing that 89% of students favour gamified learning, the app employs behavioural psychology principles through daily challenges with progress tracking, AR mini-games, social leaderboards, and real-world impact dashboards to incentivise sustainable actions such as recycling and energy conservation. By merging education with interactive gameplay, the initiative aims to increase student engagement with SDGs by 50% while fostering measurable behaviour change. Future development plans include school partnerships for curriculum integration, amplifying the app's potential to redefine sustainability education as a dynamic, student-driven process that empowers youth as active change agents for a sustainable future, perfectly aligning with the competition's theme of 'Transforming Education.'

Keywords: Sustainable Development Goals, Mobile app, Student engagement

INTRODUCTION

Awareness of the Sustainable Development Goals (SDGs) among youth is a crucial foundation for fostering a generation committed to sustainability. The SDGs, launched by the United Nations in 2015, aim to address demanding global issues such as poverty, climate change, and inequality. These 17 interconnected goals provide a universal framework for sustainable development, emphasising the urgent need for collective action across all sectors of society. Youth, as future leaders and innovators, represent a critical demographic whose understanding and internalisation of these goals are important

for achieving the 2030 Agenda. However, understanding and internalising these goals require thoughtful engagement mechanisms, particularly among youth populations.

Despite a growing global discourse around sustainability, a significant challenge continues where many students are aware of sustainability concepts but lack practical engagement with the SDGs (Maoela et al., 2024; Yuan et al., 2021). Traditional educational methods, often relying on lectures and textbooks, have proven insufficient in driving the behavioural change necessary for adopting sustainable practices (Espino-Díaz et al., 2025; Ribeiro et al., 2023). This leads to a disconnect between theoretical knowledge and actionable habits. Furthermore, there is a significant lack of personalised, interactive tools that effectively encourage students to integrate sustainable habits into their daily lives (Rivera, 2025; Yaacob et al., 2024). Our survey results indicate that while 92% of students are familiar with SDGs and sustainability practices, there is a clear demand for more engaging approaches, with 89% expressing interest in an app that makes sustainability fun and rewarding.

Existing solutions primarily encompass awareness campaigns, workshops, and theoretical lessons on sustainability. While these initiatives are valuable for disseminating information, they often fall short in fostering sustained engagement and translating knowledge into consistent behavioural change. Although some mobile applications exist in the sustainability space, most tend to focus on information delivery rather than incorporating gamified engagement and habit-building mechanics. This project addresses this critical gap by proposing a novel approach that combines gamification and behavioural nudges to make learning about and practicing sustainability both fun and actionable. Our solution aims to foster community-driven challenges, encouraging peer participation, and providing real-world impact tracking to demonstrate to students that their contributions matter.

The primary objective of this project is to design, develop, and evaluate a gamified mobile application aimed at enhancing students' knowledge of the SDGs and promoting their active engagement in SDG-aligned practices. Specifically, the app seeks to: 1) raise awareness of SDGs through interactive quizzes, mini-games, and augmented reality (AR) experiences; 2) promote sustainable habits via daily challenges and rewards; 3) encourage participation in local sustainability initiatives; and 4) foster a sense of responsibility by tracking both individual and collective impact.

The significance of this project lies in its potential to enhance sustainable education by transforming abstract sustainability concepts into tangible, rewarding experiences. By leveraging the pervasive nature of mobile technology and the inherent appeal of gamification, this app can foster responsible citizenship and catalyse a shift towards more sustainable behaviours among the youth. The expected short-term impact includes increased engagement with SDG topics, while the long-term goal is to drive concrete behaviour change, ultimately leading to more sustainable campus communities and beyond. In essence, this mobile application will transform daily sustainable actions into engaging challenges, rewarding users for their participation and demonstrating their collective impact on global goals.

METHODS

This study employed a quantitative research design to investigate the effectiveness of a gamified mobile application in promoting Sustainable Development Goal (SDG) practices among students. The target audience comprised youth, specifically university students, who were digitally native and represented a crucial demographic for fostering sustainable habits. A convenience sampling technique was utilised to recruit participants for data collection. Primary data was gathered through an online survey, designed using Google Forms, and widely distributed via university WhatsApp groups to ensure a broad reach within the target population. This survey assessed students' current awareness, knowledge, and attitudes towards SDGs, as well as their existing sustainable habits.

RESULTS AND DISCUSSION

The preliminary data collected from 49 student respondents provided crucial insights into their awareness of Sustainable Development Goals (SDGs) and their receptiveness to gamified approaches for promoting sustainable practices.

Table 1. The level of familiarity with SDGs

Level of familiarity	Percentage
Very familiar	44.9%
Somewhat familiar	46.9%
Not familiar at all.	8.2%

Table 1 revealed a high level of familiarity with SDGs and the general concept of sustainability, with 92% of respondents indicating familiarity. Specifically, 44.9% reported being "Very familiar" and 46.9% "Somewhat familiar" with the SDGs, confirming a foundational awareness among the youth demographic. However, this awareness did not consistently translate into widespread practical engagement across all sustainable habits.

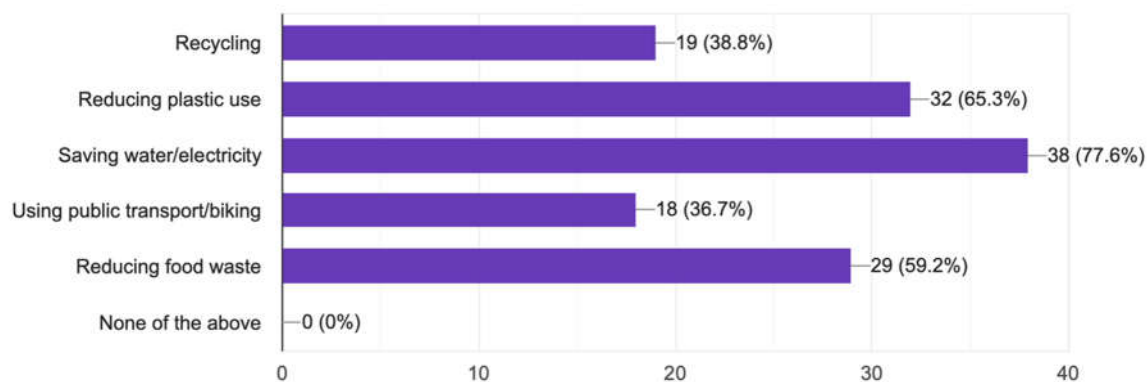


Figure 1.: Current practice of any sustainable habits

While a significant portion of students practised saving water/electricity (77.6%) and reducing plastic use (65.3%), engagement in other crucial habits like recycling (38.8%), using public transport/biking (36.7%), and reducing food waste (59.2%) showed room for improvement (see Figure 1). This disparity between awareness and consistent action validates our initial problem statement, highlighting the need for more effective mechanisms to bridge this gap.

The survey results strongly indicated a demand for more engaging and rewarding methods to promote sustainable behaviours. Notably, 89% of respondents expressed that they would engage more with sustainability if it were presented in a fun and rewarding manner.

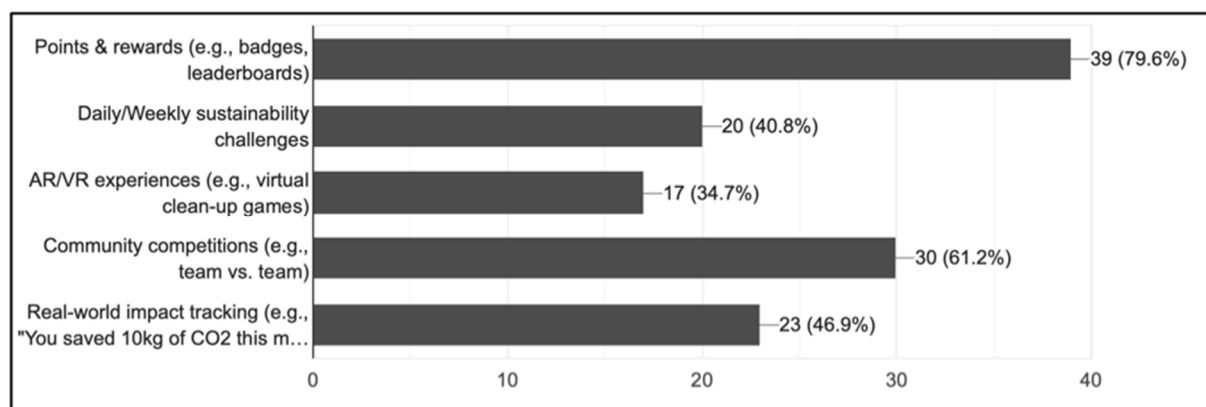


Figure 2.: Features that motivate engagement with a sustainability app

Figure 2 shows that this finding directly supports the core premise of our project: gamification can serve as a powerful tool to motivate behavioural change. When asked about motivating features for a sustainability app, the top preferences were a points and rewards system (79.6%), community

competitions (61.2%), and real-world impact tracking (46.9%). Daily/weekly sustainability challenges (40.8%) and AR/VR experiences (34.7%) also garnered significant interest.

Table 2.: Intention to use of mobile app

Intention to use	Percentage
Yes	67.3%
No	10.2%
Maybe	22.4%

Furthermore, 67.3% of respondents explicitly stated they would use a mobile app that makes learning about sustainability fun through games, challenges, and rewards, with an additional 22.4% indicating "Maybe." Table 2 collectively affirms the viability and potential impact of a gamified mobile application. The high demand for features like points, community challenges, and progress tracking directly informs the design of our app, ensuring it incorporates elements that are most likely to drive user engagement and facilitate the adoption of sustainable habits, thereby fostering both individual responsibility and collective contribution towards the SDGs.

The results align closely with Piki et al. (2024) and Silveira et al. (2023) on sustainability education, both of which emphasise the effectiveness of mobile game-based learning in enhancing engagement with the SDGs. Similar to the students' strong preference for interactive and rewarding approaches, SDG Quest (Piki et al., 2024) and the IGI app (Silveira et al., 2023) demonstrated that gamified features, such as rewards, challenges, and progress tracking, can significantly increase motivation and behaviour change. These studies reinforce the idea that while awareness exists, gamification offers a promising method to transform that awareness into sustained, actionable habits supporting environmental and social goals.

CONCLUSION

This study highlights the critical need for innovative approaches to foster sustainable development practices among youth. The "Gamifying Sustainability" mobile application emerges as an important tool to bridge the gap between awareness and action regarding the Sustainable Development Goals (SDGs). By leveraging gamification, the app aims to actively engage youth, transforming abstract concepts into tangible, rewarding daily habits. Our preliminary survey data strongly validates this approach, with the majority of them expressing a desire for fun and rewarding sustainability engagement and a clear preference for gamified features like points, community challenges, and progress tracking. While the convenience sampling method and limited sample size of this initial survey present a limitation in generalizability, the findings provide significant evidence of the app's potential to significantly raise SDG awareness and promote practical, sustainable habits among the target demographic. This app represents a scalable and engaging solution to cultivate a generation committed to a sustainable future.

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