

Gamification Beyond Competition: the Case of DPG Lab Collaborative Learning Program for High-School Girls by GameLab KBTU and UNICEF in Kazakhstan

Authors : Nazym Zhumabayeva, Aleksandr Mezin, Alexandra Knysheva

Abstract : Women's underrepresentation in STEM is critical, worsened by ineffective engagement in educational practices. UNICEF Kazakhstan and GameLab KBTU's collaborative initiatives aim to enhance female STEM participation by fostering an inclusive environment. Learning from LEVEL UP's 2023 program, which featured a hackathon, the 2024 strategy pivots towards non-competitive gamification. Although the data from last year's project showed higher than average student engagement, observations and in-depth interviews with participants showed that the format was stressful for the girls, making them focus on points rather than on other values. This study presents a gamified educational system, DPG Lab, aimed at incentivizing young women's participation in STEM through the development of digital public goods (DPGs). By prioritizing collaborative gamification elements, the project seeks to create an inclusive learning environment that increases engagement and interest in STEM among young women. The DPG Lab aims to find a solution to minimize competition and support collaboration. The project is designed to motivate female participants towards the development of digital solutions through an introduction to the concept of DPGs. It consists of a short online course, a simulation videogame, and a real-time online quest with an offline finale at the KBTU campus. The online course offers short video lectures on open-source development and DPG standards. The game facilitates the practical application of theoretical knowledge, enriching the learning experience. Learners can also participate in a quest that encourages participants to develop DPG ideas in teams by choosing missions throughout the quest path. At the offline quest finale, the participants will meet in person to exchange experiences and accomplishments without engaging in comparative assessments: the quest ensures that each team's trajectory is distinct by design. This marks a shift from competitive hackathons to a collaborative format, recognizing the unique contributions and achievements of each participant. The pilot batch of students is scheduled to commence in April 2024, with the finale anticipated in June. It is projected that this group will comprise 50 female high-school students from various regions across Kazakhstan. Expected outcomes include increased engagement and interest in STEM fields among young female participants, positive emotional and psychological impact through an emphasis on collaborative learning environments, and improved understanding and skills in DPG development. GameLab KBTU intends to undertake a hypothesis evaluation, employing a methodology similar to that utilized in the preceding LEVEL UP project. This approach will encompass the compilation of quantitative metrics (conversion funnels, test results, and surveys) and qualitative data from in-depth interviews and observational studies. For comparative analysis, a select group of participants from the previous year's project will be recruited to engage in the DPG Lab. By developing and implementing a gamified framework that emphasizes inclusion, engagement, and collaboration, the study seeks to provide practical knowledge about effective gamification strategies for promoting gender diversity in STEM. The expected outcomes of this initiative can contribute to the broader discussion on gamification in education and gender equality in STEM by offering a replicable and scalable model for similar interventions around the world.

Keywords : collaborative learning, competitive learning, digital public goods, educational gamification, emerging regions, STEM, underprivileged groups

Conference Title : ICGE 2024 : International Conference on Gamification of Education

Conference Location : Kyoto, Japan

Conference Dates : November 18-19, 2024