



DigiEduHack Solution

Aalto University - Engaging Virtual Learning

Challenge: Aalto University - Engaging Virtual Learning Challenge 2021

Serious Games to Supplement Asynchronous Lessons

Technology is transforming teaching and learning

Modernized teaching methods will be adopted, including the use of emerging technologies for educational purposes such as e-education, mobile-education and game-based learning as the paradigm of literacy shifts from pen to computers and tablets.

Team: ONE ZERO

Team members

Natasha Mehmood and Urooj Hamid

Members roles and background

Natasha Mehmood: Expertise on areas of curriculum that can be digitized and converted into games. Content provision. Local context for the eLearning platform usage. Story-boarding.

Urooj Hamid: Visual Communication Designer/Graphic Designer/ UI UX Design Expert

Our future team members will be subject matter experts, programmers, developers and partners.

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Solution Details

Solution description

We propose to develop a mobile application using gamification techniques to convert the single national curriculum initially at primary level (I - V) into an engaging eLearning platform for improved learning with the help of serious games. This student-centered application will initially focus on covering basic subjects such as English, Math, Science and Urdu followed by a complete integration of all subjects into the application. The application will make learning more fun and accessible to help Pakistan achieve Sustainable Development Goal (SDG) 4 of access to quality education and help to reduce the number of out-of-school-children (OOSC). The concept of gamification will be introduced to make pupils fond of learning while offering real-time feedback. The game-based learning application will have a reward system to show student progress and achievement while competing with other pupils as shown on the leaderboard. Inspired by the Moral Education (ME) curriculum of United Arab Emirates (UAE), this application will not only be used to improve the educational component of student learning but have a social impact through games regarding character, safe community, civic education and cultural studies. Serious games will be designed on social distancing, plantation, volunteering and body awareness activities to help develop responsible, learned and resilient youth. The ME curriculum will require constant updating to cater for the modern-day challenges faced by individuals and communities.

We propose to revamp the teacher training curriculum through an application focusing on improving the major areas of teaching to improve the delivery of SNC. The teacher training curriculum will help teachers build instructional leadership, design instructions focusing on the essential facets of enrichment activities and evaluation parameters, embedding serious games and innovative learning methods in lesson plans; and to motivate learners.

A mobile application is also proposed to bridge the gap of financial inclusion of the youth and provide an opportunity of financial inclusion for the youth. Financial literacy at an early age help kids to have a good relationship with money and equips them with a lifelong skill. The application will provide a platform for an engaging and interactive learning experience with the help of serious games. The purpose of this application will be to help the youth make informed spending decisions, prepare budgets, develop savings attitude, manage personal finances efficiently and the basic know-how of accounting and book-keeping.

Solution context

Single National Curriculum (SNC) was launched with the idea of one system of education for all however the implementation of the curriculum has been a challenge even though the government has extensively planned for it as a part of its education policy. Most private schools have still not adopted it and the current resources and capacity of public schools is insufficient to teach the new syllabus and there is resistance from Madrassah's as well. Teachers are one of the most critical elements of the education system of Pakistan and they are the front-line workers imparting knowledge and skills. Lack of sufficient teacher training hinders the implementation of SNC curriculum effectively. The teacher training curriculum is outdated and needs updating to inculcate

modern day challenges and learning styles to enable students to realize their individual potential. Pakistan ranked the 2nd last amongst the low middle-income countries in a testing scheme “Trends in International Mathematics and Science Study” (TIMSS) conducted in 2019 to test the learning outcomes of English and Math. Our solution aims to educate, engage and empower people in all aspects of their lives irrespective of where they live with the help of innovative learning methods. The future of the youth of Pakistan is dependent on the access to quality education to achieve great financial and social development. Bringing an innovative idea comes with its own set of challenges. Changing the mind-set of how games are perceived in a Low-Middle-Income country context and then using serious games to impart knowledge and achieve educational objectives will be a challenge. Building partnerships with public sector, private sector and non-profit organizations to work towards achieving the same goal will be a challenge too.

Solution target group

The target group for the student-centered application will be the children who are enrolled in Grade I-V or the 22.8 million Out of School Children (OOSC) of Pakistan (initially targeting 10% of this number), the teacher-centered application will be specifically for the teachers of public schools imparting the Single National Curriculum for Grade I-V and the Financial Inclusion application will be targeted towards the adults who are lacking financial literacy and don't have access to formal financial services. During the COVID-19 pandemic, increasing use of technology for distant learning has led to the adaptation of innovative methods to improve learning. The world is at a technology boom with 3.2 billion people owning smartphones globally. Statistics show that the number of smartphone users in Pakistan will rise to 48.81 million by 2025 and we want to avail this opportunity to make education and knowledge accessible to everyone.

Solution impact

The solution we proposed will have a direct impact on improving the accessibility of educational resources, decreasing the number of Out of School Children (OOSC) in Pakistan, improve the cognitive skills of students with game based learning, training teachers using technology and games and help the youth financially include to access the formal financial services available in Pakistan. Video games can improve problem-solving skills and strategic games can enhance cognitive skills of the players and as a matter of fact improve the academic grades of students. Strategic video games promote academic grades, as millions of adolescents play video games on daily basis. In recent years, electronic games have gained an important place in the lives of children and teenagers. Generation Z and Millennials have shown great interest in Game-Based Learning (GBL). Games for Learning Institute was set up at New York University in 2008 to research on what makes serious games engaging and effective academically. New York Quest to Learn Secondary School is investigating gaming as a pedagogical model while Serious Games Institute in Coventry is also working on the gamification journey to model professional practice. Acceptability of teachers to use games for active learning as a blended learning model was established after a survey by Future lab and other organizations. The gamification journey will not be an easy one, as games with fun but having poor content or games with strong content but less engaging are ineffective in achieving learning goals. The impact of GBL application in Pakistani context is less researched but a study identified positive influence on secondary students' engagement in science classrooms, however, it was not equally effective for all students. A study in the elite schools of Lahore measured impact of games on learning. Few games were highlighted with their academic benefit such as students playing Minecraft were exposed with different minerals which helped them in geography class, Assassin's Creed is based on events from 293 AD to 1793 AD where task-based response is required from players improving their searching skills and FIFA helped players learn how the football world

works. In the online gaming community players don't just have to play but simultaneously communicate with other game players, hence improving their social skills. However, with all the positive effects gaming can have, there are evident negative effects as well. In the same study students highlighted how games with bloodshed can have a negative impact on their learning and that online gaming is harmful for health where players sit in front of the screens for hours. Another study validated that GBL is an enhanced mode of teaching and helped both students from private and public schools to improve their concepts with the help of serious games on Skills Arena. Availability of computers or digital tools are a problem for public schools, but most private schools do not have this problem. Students prefer doing game exercises on computers rather than the traditional paper-based method. The introduction of new concepts through games is more effective.

Solution tweet text

Modernized teaching methods will be adopted, including the use of emerging technologies for educational purposes such as e-education, mobile-education and game-based learning as the paradigm of literacy shifts from pen to computers and tablets

Solution innovativeness

Technology is transforming teaching and learning and COVID has triggered technology intervention and digitized the learning process. Use of serious games for learning has been very rare let alone using it for specific areas such as Single National Curriculum for Grade I-V, teacher training and for youth financial inclusion. There has been work going on in different areas of eLearning in Pakistan and over the globe, we look forward to building healthy partnerships to avoid duplication of ideas and work but provide innovative solutions and serious games in areas that are unexplored.

Solution transferability

Our solution can be used in other Low-Middle-Income-Countries such as Bangladesh, India, Nepal, etc. Countries facing the challenge of OOSC can make use of student-centered application to increase school participation. Our Teacher-centered application can be used to train teachers with interesting and relevant games and our financial inclusion application can be used in countries that face the challenge of low financial literacy in youth.

Solution sustainability

The roadmap of our project implementation includes the identification of games needed and developing those games for different aspects of the curriculum and financial inclusion, collaborating for other eLearning resources and building partnerships to use material already available, use a very popular approach to assign star-students with the task to spread awareness about the application and games in their social circles and bring as many users from the target audience as possible, encourage participation through E-certification which will be approved by Government Authorities and the target audience can use that as an official document to show learning.

Solution team work

Currently we are a team of two like-minded women with the same goal to achieve which makes our coordination and communication efficient and effective. My expertise lies in digital education, content creation, preparing digitized lesson plans and scheme of work and my partner has the

capacity to convert my ideas into reality. She is a Visual Graphic Designer and dreams big! We intend to grow by increase the number of like-minded people in our team who can contribute to the idea and its implementation. We need subject matter experts, programmers, developers, UI/UX design experts, etc. to bring this idea into a physical shape so it can start tolling out.

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