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Article

Development of a Kyrgyz Educational Platform for Personalized Learning and Knowledge Management

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Abstract: This work presents the design of a Kyrgyz learning platform for learning with technology, focusing on personalized learning and knowledge management. The platform, being designed as a mobile application, possesses a gamified personalized learning experience with support both for the Kyrgyz and English languages and offline capability. Developing the platform was achieved through the process of an agile development process with user-centric design, feedback, and continuous testing. The following is the detailed design of the Kyrgyz learning platform. Early pilot deployment results showed increased learner engagement, usability, and positive feedback for cultural appropriateness. The platform is also designed to preserve Kyrgyz cultural heritage, in this instance the Epic of Manas, in a digital form. The article discusses the aspects of the platform, such as adaptive quizzes and analytics, and the potential for further educational application throughout Kyrgyzstan.

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Classifier: 371.3 (Educational Technology) + 306.44 (Language and Culture)

Introduction

Kyrgyzstan's schooling is marred with issues, particularly in rural areas, where there is little educational content and consistent internet access.

Over 62% of the population of Kyrgyzstan live in rural areas, as was realized when schools became online through COVID-19. Limited access to sufficient internet and equipment further widened the digital gap and hampered provision of quality education in an appropriate format. Also, existing digital content is not suitable culturally, particularly for the Kyrgyz culture such as the Epic of Manas. Personalized learning fills the gap by aligning in content, pace, and feedback students' own distinct needs. Initial pioneer research demonstrates that personalized learning significantly improves outcomes. Supported by more sophisticated education technology, data-driven constructive feedback and adaptive learning are provided on platforms, replicating the advantage of personalized guidance. Education knowledge management systems organize, capture, and spread education content in order to enable ongoing improvement.

This paper documented the development of a Kyrgyz learning platform that aims to provide personalized learning with cultural knowledge. The platform starts to tackle the Epic of Manas and related issues in Kyrgyz language, history, and culture. The platform provides a gamified, bilingual, offline-accessible experience that tackles concerns on accessibility and culture.

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Literature Review

Individualized instruction, or one-to-one instruction according to the needs of a learner, has developed with advances in instructional technology. Studies, like Bloom's (1984) experiment on one-on-one tutoring, demonstrate the potential of one-to-one instruction to enhance learning outcomes in learners. New technologies, including adaptive learning systems, offer scalable personalization through varying the level of difficulty in content according to performance by a learner.

Global e-learning platforms like Khan Academy and Duolingo have personalized features.

These platforms are, however, more inclined towards universal curricula and languages and limit their applications in multicultural setups. Academic studies indicate that students learn more when what they are learning is familiar to them culturally, and localized platforms are thus the need of the hour. Knowledge management in education involves organization and storage for reuse of material to facilitate learning. Above all, it is particularly valuable to preserve cultural heritage, i.e., the Epic of Manas, in computer archives. Methodology The platform was created based on a design science research methodology with agile methods, and iterative refinement was provided. When discussing with teachers, curriculum experts, and cultural stakeholders, preliminary requirements were obtained. The most important user requirements based on user feedback were: affluent content, offline support, bilingualism, and tracking progress. Platform content, such as Manas stories and quizzes, was developed through an authoring process involving subject matter experts to ensure validity and cultural sensitivity.

The creation was accomplished through agile sprints with functionality released step by step. The first sprints focused on the building of the core lesson viewer and quiz system, with later features including user profiles, bilingual toggles, and offline data persistence. User feedback was collected at the end of every sprint to develop the platform based on real-world usage.

Platform Development

The application is a mobile, offline-enabled application. It is an interactive user interface created with Flutter, with cross-platform support. The functionalities include:

Offline Mode: The main content is accessed offline, and the data are stored locally via Hive, a NoSQL Flutter database. The application syncs data whenever there is internet connectivity, allowing seamless learning in low-connectivity areas.

Bilingual Content: There is both English and Kyrgyz content, and a language switch can be used to switch between the two. This is helpful for language learning as well as offering content for various types of learners.

Gamification and Progress Tracking: Points are awarded for the completion of lessons and quizzes, and activity is rewarded based on a leveling system for users. Gamification features such as a streak counter and achievements reward users for continued use of the application.

Quizzes with Feedback: Users take quizzes after every lesson to aid in learning reinforcement. Feedback on quiz performance is provided instantly so that learners can track progress and areas of improvement.

Knowledge Management: The material is stored in an organized manner such that it is easy to modify and incorporate content. The system also collects anonymous user performance data that can be utilized for improving content as well as provide insights on average learning problems.

Results and Discussion

A pilot test on 50 users showed promising results. Students finished an average of 5.3 out of 6 lessons offered with high motivation. Quiz scores, from 78% on the initial attempt to 92% on the

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second attempt, reinforced the concepts of mastery learning. Around 60% of students attained a daily streak, and over half advanced to Level 2 with high motivation.

Student feedback was incredibly positive. 88% of students indicated that the app engaged them in learning the Epic of Manas in a more significant way than textbooks. The gamification aspects proved to be hit, with several students indicating that the quiz and points feature was the standout in the app. Teachers pointed out that the app was a perfect supplement, and students could now understand the topic better.

While these have been successes, there are a few areas for improvement as well. The users asked for more visual content and lessons beyond the Epic of Manas. There were some technical grievances, but minor ones, such as incorrect quiz answers, but those were received and addressed at the time. These findings will be utilized to make future improvements, including adding more content and visual material.

Conclusions

This article outlines the development of a customized learning platform integrating cultural learning and modern pedagogical principles. The platform integrates bilingual content, gamification, offline access, and personal learning features to offer an interactive and culturally relevant learning environment. Initial findings indicate excellent user engagement and learning progress, suggesting the potential for broader use of the platform in the education system of Kyrgyzstan.

Future directions involve the development of the content library, integration of adaptive learning algorithms, and investigation of mainstream education integration.

The site demonstrates how technology can be used for the preservation and education of cultural knowledge and enhancement of education results.

With distance education, as things go on, the success of this project heralds the need to localize content and pedagogy to suit the specific needs of students within different cultural backgrounds.

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