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GAME-BASED EDUCATIONAL SOFTWARE FOR IMMERSIVE LEARNING IN HISTORICAL CONTEXTS THROUGH INTERACTIVE SCENARIOS AND SIMULATIONS

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Abstract

This paper explores approaches to developing game-based educational software that enables users to immerse themselves in historical contexts through interactive scenarios and simulations. It analyzes the effectiveness of gamification in education and the role of virtual experiences in enhancing the assimilation of historical knowledge.

Keywords: educational software, gamification, historical context, simulation, interactive scenarios, virtual experience, education.

Introduction

Modern educational technologies are increasingly adopting innovative solutions that blend learning with gameplay elements. This approach making the learning process more engaging and effective, especially in areas where it is important to build an understanding of the past—such as history education.

Interactive simulations and scenarios allow learners to immerse themselves in specific historical events, better understand the causes and consequences of certain decisions, and feel like direct participants in those events. Gamification in educational software promotes both knowledge acquisition and the development of analytical thinking, which is a key goal of modern education.

Research Results

As a result of the conducted research, a concept was developed for educational game-based software designed to deeply immerse users in a historical context through interactive scenarios and simulations. The main goal of this system is not only to transmit historical knowledge but also to foster an emotional connection with the past by engaging users as active participants in the simulated events [1].

The software architecture consists of several key modules, including, such as the simulation engine, narrative module, user action tracking system, and an adaptive interaction interface. These modules work in close coordination to create realistic scenarios that dynamically respond to the user's choices and actions [2].

One of the leading concepts in development was the dynamic reconstruction of historical context, enabling alignment with authentic historical events while allowing for variability [3]. Through the use of scenario modeling methods, rule-based systems,

and probabilistic assessments, it is possible to simulate alternative historical paths, thereby increasing user interest and engagement.

Interactivity is achieved through a system of adaptive scenarios that evolve according to the user's learning style, pace of progression, and previous decisions. Machine learning models are used to identify thinking types and decision-making strategies and then adjust the complexity and direction of historical development accordingly [4].

Particular attention is paid to the recommendation subsystem, which guides the user toward new scenarios or historical figures related to their past gameplay experience. It considers interests, engagement level, play style, and even the current mood detected during gameplay. This information is gathered through unobtrusive in-game surveys throughout the game [5].

A document-oriented MongoDB database is used to store data on user progress, scenario branches, user choices, and analytical information. All computational tasks are distributed across microservices developed in Python using AI libraries such as TensorFlow, PyTorch, and scikit-learn. Modules communicate via a RESTful API.

The system also adheres to ethical standards: ensuring transparency in data collection, allowing users to opt out of certain data recordings, and supporting anonymous gameplay mode. Therefore, the research results demonstrate that the combination of gamification, historical authenticity, adaptive learning, and personalized interaction creates an effective tool for immersing users in historical themes.

Conclusions

Game-based educational software opens up new horizons in the acquisition of historical knowledge. Adaptive scenarios, emotional involvement, personalized recommendations, and flexible learning paths transform static historical facts into an engaging journey through time. The proposed system integrates educational, technological, and ethical approaches, creating a new paradigm of digital education that fosters historical awareness and critical thinking.

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