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SCIENCE

Gamification
of
Education
using
Multi-Armed

Bandit
Algorithm

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INTRODUCTION

This study is driven by the goal of enhancing the experience through the Decision Tree Thompson Sampling (DTTS) algorithm. The study focuses on effectiveness in personalized learning, and exploring its adaptability across diverse subject areas. The research aims to provide valuable insights into the various impacts of the DTTS algorithm on Algebra, particularly Algebra Algebra. The results of the study were published in the Journal of Game Theory and Game Theory (JGTG) (2013). The study was published in JGTG's online edition, which is available in English and Spanish. This research on gamification in education, specifically employing the Decision Tree Thompson Sampling (DTTS) algorithm, holds significance in several key dimensions. It provides a robust framework for exploring the intersection of gamification, personalization, and adaptive learning. The study is purposefully limited in scope to ensure clarity and coherence in its objectives. The findings can assist school administrators in making informed decisions about resource allocation for educational technologies. It can also help reduce educational inequality, ensuring that all students, regardless of their socio-economic background, have access to high-quality, personalized education.

METHOD

The Gamification of Education integrates the Multi-Armed Bandit (MAB) and the DTTS (Dynamic Time-Triggered Switching) Algorithm. The MAB Algorithm optimizes the selection of learning content based on students' performance metrics. The DTTS Algorithm orchestrates real-time communication and scheduling within the gamified learning environment. The study focuses on evaluating the algorithm's adaptability and effectiveness in personalized learning, understanding student satisfaction, and enjoyment, and exploring its adaptability across diverse subjects. The ALGE-BRUH webgame is the primary platform where students engage with the gamified content. The webgame interacts with a database to store and retrieve user information and game data. Based on the user data, the webgame uses the DTTS algorithm to generate personalized game actions. This algorithm helps tailor the educational content to match the student's learning style, preferences, and progress. The developer shall conduct an extensive background reading, conducting surveys, and employing observational methods to amass the requisite data. The ALGE-BRUH webgame is used to provide customized educational content. The study aims to assess the effectiveness and adaptability of the AL GE-BRuH web game. It will collect data from Grade 10 students enrolled in junior high school. The data collection approach will be divided into two phases. The first stage will involve the methodical collection of registration-related user data. The second phase will focus on collecting user feedback about the web game's educational effectiveness and impact. The game is designed to be used in schools. The game has been designed to meet school curriculum standards. The 5-point Likert Scale is used to rate the game's educational validity and relevance. The rating scale is based on the 5th point of the 5- point scale. The score of 5 is considered to be a good score. The ratings are based on a 5th-point scale of 5. The scoring scale includes the rating of 1 to 5. It is based upon a 5 point scale of 4.

RESULTS

The project involves the development of a web-based game system named alGE-BRUH. It is designed to integrate the Decision Tree Thompson Sampling (DTTS) algorithm into gamified educational content. The primary objective of this webgame is to provide an effective method for assessing and engaging students' performance and learning, specifically in Grade 10 algebra. The system is built using HTML, CSS, and JavaScript for the front-end interface and game logic. It offers an interactive platform where students can track their progress and performance. The detailed statistics and adaptive learning paths aim to improve their understanding of algebra concepts. The ALGE-BRUH web game focuses on providing a user-friendly interface that is both clean and intuitive. The design approach aligns with popular internet 'meme' culture, aiming to make the user experience entertaining and engaging for Grade 10 students. The system's ability to offer real-time analytics further enhances its performance. However, the system's performance is highly dependent on a steady internet connection, which could be a limiting factor in areas with inadequate internet infrastructure. The ALGE-BRUH webgame has the potential to significantly enhance educational outcomes and support academic achievement in Grade 10 algebra. The majority of students reported that the game helped improve their problem-solving abilities and overall academic performance. The user-friendly and engaging game design contribute significantly to these positive outcomes. However, considerations around data security, privacy, and internet dependence are essential for ensuring its sustainable success. The game was visually pleasing and made the respondents feel happy. It was also fun to play.

DISCUSSION

The research on the "Gamification of Education using Multi-Armed Bandit Algorithm" gathered insights from Grade 10 students. Students were asked to rate the game's perceived value, usefulness, effort and engagement, and perceived competence. The results indicate a predominantly positive reception among the respondents. The mean ratings illustrate the overall satisfaction with the game. The study concludes that the game was generally well-received by students. The findings are presented in terms of the mean ratings, which are: ALGE-BRUH-26%26%29% 7.24% 0.37% 2.22% 62.22% strongly believed that playing the game could help improve their problem-solving abilities, and 57.78% felt it could benefit their overall academic performance. A noteworthy 64.44% would be willing to play the game again because of its educational value. 53.33% strongly agreed that they were good at the game, and 51.11% felt they did well compared to other students, and 55.56% felt competent after playing for a while. Only 17.78%, 28.89%, and 8.89% strongly disagreed that the game was boring.