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Numeracy Literacy Educational Game-based RPG Maker MV in Elementary Schools

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ABSTRACT

This research discusses the implementation of numeracy literacy in mathematics learning into educational games based on RPG Maker MV for elementary school students. Technological advances allow game-based learning to come in various genres and can be created by anyone with any background, including those involved in the world of education. By implementing numeracy literacy and challenge games into the learning process, students become more active and improve student learning outcomes, and teachers continue to play an active role as facilitators. This research aims to design an educational game that includes numeracy literacy and is created using the RPG Maker MV application to improve students' HOTS abilities in mathematics subjects. This research uses the Nieveen model for game development. In this research, integrating RPG-based educational games into numeracy literacy in mathematics learning went well in designing teaching materials, challenges, and questions. The effectiveness of the RPG Maker MV-based numeracy literacy game based on the results of working on the hottest posttest questions has met the effective criteria. This research can be complementary in terms of educational games, numeracy literacy, and HOTS questions.

Keywords: Game, numeracy literacy, RPG maker MV

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INTRODUCTION

The report card score for students' numeracy literacy skills at an elementary school in Durenan District is 1.88, indicating they are at a professional level (Hapsari, 2023). The school's numeracy literacy score has improved, but more students

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need proficiency. The school connects numeracy with learning but does not fully utilize resources like computer labs. Syaifudin (2022) states that innovative teaching methods using "PEGALINU" media can significantly improve students' numeracy literacy skills, as evidenced by statistical values in Budiningtyas et al. (2022). Game-based learning to improve numeracy literacy has also been carried out (Ulfa et al., 2022), showing that initial results were 53% but increased to 89% after game-based learning at Nurul Muttaqin Islamic Elementary School, Malang City.

Numeracy literacy skills are directly proportional to students' HOTS abilities, requiring higher-order thinking in solving problems presented by PISA. by Novitasari (2022). When students' level of numeracy literacy skills is not optimal, students will experience problems in working on HOTS questions (Pramesthi et al., 2022). Interviews and research indicate that the school needs literacy-based games to enhance students' numeracy literacy skills, preparing them for everyday life and AKM activities, replacing the National Examination in 2021.

AKM measures two types of literacy: reading and numeracy (Sulistyani & Kusumawardana, 2022). The main focus of AKM is to fulfill students' reading and numeracy literacy skills. The focus of the discussion this time is on numeracy literacy. Numeracy literacy is one of the essential literacies that needs to be mastered to face the era of Industrial Revolution 4.0, known as the 21st century. Learning media, like RPG Maker MV, has been developed to enhance elementary school students' numeracy literacy, particularly in mathematics learning about Multiples and Factors.

RESEARCH QUESTIONS

The study explores the impact of game-based learning on student engagement and learning outcomes in elementary school mathematics. It involves prototyping a numeracy literacy game using RPG Maker MV, focusing on middle-category schools. The research includes interviews, questionnaires, and question sheets, and includes a literature survey and problem analysis.

The game enhances students' numeracy literacy skills by allowing them to solve mathematical problems, analyze information, and form opinions using FPB material for class V elementary school. Based on the results of the data obtained by referring to the stages of prototyping model development (Nieveen et al., 1999), Mathematics teachers in schools are implementing numeracy literacy learning activities, but Chromebook-based games are lacking. A role-playing game (RPG) is developed, featuring a young man treating a virus in a village, forest, and maze.

Three indicators of numeracy literacy are taken from Nadjamuddin and Hulukati (2022). This game enhances students' numeracy literacy skills by allowing them to answer mathematical problems, analyze information, and form opinions—the draft I is validated

by draft material and media experts. The media expert validated the RPG Maker MV 85.7 numeracy literacy game, stating its ease of use, adaptability to school media availability, and accompanying guidebook. Mathematics games with visually appealing appearances, interactive writing, and creative ideas enhance students' understanding of subject matter through easy-to-understand content and images. Wulandari et al. (2023) stated that symbols and visual images make it easier for students to achieve goals and understand and remember the information and messages in the photos. Material validation in numeracy literacy games involves material, language, and practicality. A lecturer with mathematics expertise scored 91.6, while a teacher of class V scored 88.9. Material aspects enhance transparency in conveying material through stories and pictures. Games are also linked to everyday life problems to make it easier for students to understand the game's conditions and apply similar things (Muna et al., 2023). Effective use of sentences can make it easier for students to understand the game's instructions and clarify the material.

The validator deemed the numeracy literacy game based on RPG Maker MV "very valid" but suggested improvements. Testing with class V students at SDN Baruharjo was convenient for students and teachers. It is based on research by Fareza and Zuhdi (2023), which states that learning media that can be used on Chromebooks is practically used in the learning process in elementary schools. Web-based digital learning has been proven to increase student involvement in learning (Arifin et al., 2023). The research results show that developing a numeracy literacy game using RPG Maker MV for elementary school students enhances their learning experience, promotes active and independent learning, and helps them understand and apply concepts in everyday life. The results of this research are consistent with research by Sari Widodo (2021)

The Nieveen model was utilized to evaluate the effectiveness of a numeracy literacy game in enhancing students' higher-order thinking skills, with four out of 27 students achieving an 80 KKM score. So, learning with digital games is more effective in learning and obtaining grades than the non-game application approach (Fitriati et al., 2021). Digital learning has been proven to increase student engagement in learning (Arifin et al., 2023). Based on these two statements, the learning process using game-based games is more effective if used in the learning process.

CONCLUSION

The research shows that educational games based on numeracy literacy are valid, practical, and effective in teaching and learning. Based on RPG Maker MV, the game increases problem-based learning (HOTS) for elementary school students, making them more motivated and familiar with symbols.

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