

ABSTRAK

Kemajuan teknologi pada abad ke-21 telah memengaruhi hampir semua bidang kehidupan, termasuk pendidikan. Teknologi dapat dimanfaatkan untuk membantu siswa memahami materi yang sedang atau telah dipelajari di kelas. Penelitian ini bertujuan untuk (1) mengembangkan game berbasis web "*Labirin Math Game*" sebagai media pembelajaran pada materi rasio untuk siswa kelas VII SMP, dan (2) mengetahui kelayakan dan kepraktisan media pembelajaran yang dikembangkan.

Penelitian ini merupakan penelitian pengembangan (*Research and Development*) dengan mengikuti model ADDIE, yang terdiri atas tahap *Analysis*, *Design*, *Development*, *Implementation*, dan *Evaluation*. Instrumen pengambilan data adalah angket, pedoman wawancara, dan pedoman observasi. Analisis kebutuhan dilakukan kepada 23 siswa kelas VIII SMP Kanisius Kalasan dan wawancara dengan guru matematika kelas VII.

Pada tahap analisis kebutuhan, guru menyadari kebutuhan media pembelajaran yang interaktif dapat membantu siswa, namun tidak memiliki waktu dan kemampuan untuk menyediakannya. Pada tahap desain, disusun *flowchart* alur sistem, alur permainan siswa, dan alur dashboard guru, serta ditentukan tools pengembangan yang digunakan yaitu: Visual Studio Code, Node.js, Express.js, Socket.IO, KaTeX, dan Canva. Pada tahap development, rancangan tersebut diwujudkan menjadi produk game web yang dijalankan melalui jaringan intranet sekolah. Sebelum implementasi, produk divalidasi oleh ahli materi dan media. Tahap implementasi dilakukan 21 siswa kelas VII SMP Kanisius Muntilan. Siswa termotivasi untuk mengerjakan soal dalam game karena memiliki fitur peringkat dan tantangan dalam game. Pada tahap evaluasi, produk mengalami penyempurnaan berdasarkan masukan validator dan siswa terkait dengan perbaikan sistem perhitungan poin, pemindahan petunjuk permainan ke halaman lobby, dan penerapan pengacakan soal untuk setiap pengulangan permainan.

Berdasarkan uji kelayakan, media yang dikembangkan masuk dalam kategori sangat valid (86,54%). Capaian tertinggi didapat pada aspek kesesuaian media dengan karakteristik game. Media yang dikembangkan memiliki tampilan visual yang menarik. Berdasarkan uji kepraktisan dari 21 siswa, media yang dikembangkan termasuk kategori praktis (78,79%). Capaian tertinggi pada aspek kesenangan siswa saat mengerjakan latihan soal melalui game. Selain itu, capaian tinggi juga diperoleh dari kesesuaian soal dalam game dengan materi yang telah dipelajari siswa. Capaian terendah pada aspek kemudahan penggunaan tanpa kendala teknis. Saat implementasi, siswa mengalami kesulitan untuk mengakses game dan memainkannya.

Kata Kunci: *Game Web*, rasio, media pembelajaran digital, *ADDIE*, gamifikasi

ABSTRACT

Technological advancements in the 21st century have influenced nearly every aspect of human life, including education. Technology can be utilized to help students understand the learning materials being taught or previously learned in the classroom. This study aimed to (1) develop a web-based game entitled Labirin Math Game as a learning medium for the topic of ratio for seventh-grade junior high school students and (2) determine the validity and practicality of the developed learning media.

This study employed a Research and Development (R&D) approach using the ADDIE model, which consists of the Analysis, Design, Development, Implementation, and Evaluation stages. The research instruments included questionnaires, interview guidelines, and observation guidelines. The needs analysis was conducted with 23 eighth-grade students of SMP Kanisius Kalasan and an interview with a seventh-grade mathematics teacher.

During the needs analysis stage, the teacher recognized that interactive learning media could support students' learning but lacked the time and expertise to develop such media. At the design stage, system flowcharts, student gameplay flowcharts, and teacher dashboard flowcharts were developed, and the development tools were determined, including Visual Studio Code, Node.js, Express.js, Socket.IO, KaTeX, and Canva. During the development stage, the design was implemented as a web-based educational game operated through the school's intranet network. Prior to implementation, the product was validated by media and subject-matter experts. The implementation stage involved 21 seventh-grade students of SMP Kanisius Muntilan. The students were motivated to complete the exercises in the game because it provided leaderboard and challenge features. During the evaluation stage, the product was improved based on feedback from the validators and students, including revisions to the point calculation system, relocating the game instructions to the lobby page, and implementing randomized questions for each replay.

The validity test showed that the developed media was categorized as highly valid with a validity score of 86.54%. The highest achievement was obtained in the aspect of the media's suitability with game characteristics. In addition, the developed media demonstrated an attractive visual appearance. Based on the practicality test involving 21 students, the developed media was categorized as practical, with a practicality score of 78.79%. The highest score was obtained in the aspect of students' enjoyment while completing practice exercises through the game. High scores were also achieved in the suitability of the questions with the ratio material previously learned by the students. The lowest score was found in the aspect of ease of use without technical difficulties. During the implementation, several students experienced difficulties accessing and playing the game.

Keywords: *web-based game, ratio, digital learning media, ADDIE, gamification*