Game Based Learning, 1(1), 2025, 28-38

Development of a web-based snake and ladders game to teach integers to fourth grade elementary students

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Article History
Received: 4 April 2025
Revised: 22 May 2025
Accepted: 28 May 2025
Published: 1 June 2025

Keywords
Game Media
Mathematics
Snake Ladder

Abstract
Many students do not like mathematics learning because mathematics learning tends to be carried out with lecture methods and learning media that are not in accordance with the characteristics of students so that students quickly feel bored and seem less varied in using the use of existing technology. This study aims to evaluate the feasibility, practicality, and effectiveness of Web-Based Games Snake and Ladders Math Go media. This research uses a Research and Development (R&D) approach using a 4D model. Data analysis used qualitative and quantitative methods using material and media expert validation sheets, student response questionnaires, and interviews. The validation results assess feasibility, the student questionnaire determines practicality, and the results of the pre-test and post-test measure effectiveness. The results of the material experts reached 87%, while the validation of the media experts reached 97.30%, both were categorized as very feasible. The results of the pre-test and post-test showed an increase of 28%, with an average N-gain of 0.72 which was relatively high. Students' responses to Web-Based Snake and Ladders Math Go Games media reached 88%, categorized as very good. These findings show that Web-Based Snake and Ladders Math Go Games media are feasible, practical, and effective to improve the learning outcomes of grade IV elementary school students.

1. Introduction

The use of learning media in this era has grown rapidly along with technological developments. Technological advances are able to increase a more varied learning media (Purnasari & Sadewo, 2020). Learning media constitutes a pivotal element within the overarching framework of the learning system. A wide array of learning media is available, each offering distinct advantages. The medium through which learning occurs can encompass a variety of formats, including but not limited to texts, modules, games, animations, slides, movies, videos, and websites. These diverse learning media can play a pivotal role in enhancing the comprehension of students, particularly in the context of educational instruction (Ramdhani & Baadilah, 2022). Learning media attracts students to teaching and learning activities if it stimulates students' learning activities. According to Wijayanti (2021), the necessity for learning media that aligns with the characteristics of elementary school students has become increasingly evident in contemporary educational settings. According to Piaget's theory of learning, the characteristics of elementary school children, ranging in age from seven to twelve, are encompassed within the concrete operational stage. This phase is characterized by the capacity to conceptualize and process logical ideas in a concrete manner (Marinda, 2020). Students require appropriate media tools that align with their characteristics to facilitate the comprehension of abstract concepts. To ensure the effective transfer of knowledge, it is essential to reinforce students' commitment to their own cognitive processes and behaviors. Moreover, learning should be achieved through experiential learning, rather than merely through the acquisition of knowledge and rote memorization. One such example is the learning of abstract concepts, which is exemplified by the discipline of mathematics (Ferryka, 2017).

Mathematics is a subject that is taught from elementary school to college level. At the elementary school level, mathematics is among the subjects of primary importance. The objective of this training is to cultivate logical, analytical, systematic, critical, creative, and cooperative thinking skills. According to Ermawati et al. (2022), mathematics is regarded as the most challenging subject by students and adults alike. Within the context of the educational environment, a considerable number of students tend to exhibit a decline in their interest in mathematics, often harboring doubts concerning the value of the time allocated to its study. According to

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Mandasari and Rosalina, (2021) at the elementary school level, the difficulties that students often face, one of which is in integer material, namely in solving integer operation problems in the form of low understanding of concepts from students about concepts related to the concept of integer operations and low skills in solving the concept of integer operations. Until now, there are still many students who feel that mathematics is a terrible learning subject. One of the causes of students' dislike for mathematics is because mathematics learning tends to be done by the lecture method without being accompanied by learning media so that students quickly feel bored and seem less varied (Rahayu & Indrawati, 2022). Therefore, it is imperative to develop an effective learning tool or media to address and mitigate the challenges encountered by DIDK participants in their mathematics studies. One strategy to address these challenges is to incorporate games into the educational process.

Game media has been demonstrated to have a positive impact on mathematics learning. Game media has been demonstrated to be an effective, engaging, and interactive method of presenting solutions to the construction and fortification of understanding in the domain of mathematics education (Indah Suciati, 2021). The educational method of learning by play affords students opportunities to engage in the autonomous manipulation and iteration of concepts, facilitate discovery, explore, and engage in practice, thereby facilitating the acquisition of a variety of concepts (Wijayanti, 2018). Consequently, game media has been identified as an effective medium for learning, as it does not engender a sense of boredom. The game media employed in the learning process also instructs students in the importance of cooperation and the development of creativity. Learning by play provides opportunities for students to manipulate, iterate, discover independently, explore, practice, and acquire a variety of concepts. (Arya Utami et al.,2024). This methodology can be utilized by pedagogues to devise educational media incorporating games, thereby fostering student engagement and enjoyment in the domain of mathematics learning. The game media aims to eliminate monotony in the learning process and to create a fun teaching and learning atmosphere because it seems relaxed. In accordance with the characteristics of elementary school students, a proclivity for concrete things and enjoyment of play is evident (Kadek & Kartika., 2021). One of the game media that is an alternative in learning mathematics that is interesting and effective is the game "Snake Ladder".

The snake and ladder game is a global pastime. The snake and ladder game is a traditional game with a long history. The game of the snake and ladder is played by two or more people using dice. The game board is composed of multiple squares, and it contains an image of a snake and a ladder. The function of the ladder is to be followed by the player, while the snake serves to direct the player in a downward trajectory. The victory of players is contingent upon the attainment of the first finish by participants (Wati, 2021). In addition to its entertaining nature, this game has been designed to promote the development of memory and critical thinking skills among students. The utilization of snake and ladder media as an instructional instrument is a critical component in the execution of educational methodologies (Andrianto, Firman, & Desyandri, 2021). The utilization of media incorporating elements of the snake and ladder game has been demonstrated to enhance student motivation in the context of mathematics education. This phenomenon can be attributed to the inherent affinity that students often exhibit towards gaming-related activities (Aziz, 2018)

By creating learning media that is in accordance with the demands of technological developments that can be adjusted to the characteristics of students so that learning is more meaningful, the development of media in digital form can be an option to develop digital media that is in accordance with the characteristics of students in elementary school. As the demands of learning in the 21st century are marked by changes in curriculum, media, technology (Rahayu & Indrawati, 2022). The use of technology-based or digital learning media helps in livening up the atmosphere in the classroom so that there is active communication and discussion, making it easier for teachers to convey material and providing interesting learning dimensions so that learning becomes effective and efficient (Anam et al., 2021). Media formed from a combination of technology creates innovation by integrating various forms of media controlled through computers or other digital tools is considered the most up-to-date method, especially when supported by advanced technology that has extraordinary capabilities (Permana et al., 2024). Thus, teachers must master technology by choosing and determining creative and innovative learning media in the development of technology-based learning. One of the subjects that supports the development of science and technology is mathematics (Juhaeni et al., 2023).

Website-based learning is one of the learning activities that takes advantage of the development of science and technology. A website can be defined as a collection of pages that display information of text data, still or motion images, animations, sounds, videos and or a combination of all of them both static and dynamic that form a series of buildings that are interrelated and connected by a network of pages or what can be called *hyperlinks* (Anjarkusuma et al., 2014). The use of the web as a learning medium provides several advantages: 1) students can do independent learning so that they can improve and expand knowledge, 2) students do more learning activities by doing activities such as observing and trying, 3) providing additional learning resources that can enrich the learning material (Setyadi & Qohar, 2017). Website-based learning media is an easy-to-access and fast medium without compromising the meaning and purpose of learning (Salsabila & Aslam, 2022).

A plethora of websites and digital platforms exist that can be utilized to develop teaching materials to support learning. These websites and platforms possess a range of advantages and disadvantages, enabling researchers to develop game media by employing multiple platforms. This approach enables the optimization of each platform's functionality and compensates for its deficiencies. Consequently, research has been conducted on the development of snake and ladder game media derived from the conventional game of snake and ladder games. These adaptations have been designed to align with contemporary technological advancements. In the design of this Web-Based Snake and Ladders Math Go Games learning media, researchers have integrated snake and ladder games with technological elements. The researcher employed the Adobe Animate platform to develop web-based games, namely "Snake" and "Ladders Math Go." Adobe Animate is one of the programs that can be found on computers. The Adobe Animate application is a versatile software that can display a variety of media, including images, text, animations, sounds, videos, and interactive games. (Izzati Amin & Sumarni Somakim, 2021). This is very appropriate because in this application there is a visual element that is preferred by children at elementary school age. This is reviewed from the characteristics of elementary school children, including those aged seven to twelve years according to Piaget's theory of learning, included in the concrete operational stage (Marinda, 2020). This Adobe Animate application facilitates the creation of visually appealing and straightforward interactive videos, images, text, animations, sounds, and games tailored to the world of children, thereby fostering student engagement and facilitating more effective learning experiences. Concurrently, Canva is an online platform that offers a variety of functions for graphic design and direct publication. Canva is available for use via applications on smartphones, personal computers (PCs), or websites. Canva is a digital platform that offers a suite of features for the creation of visual materials, including presentations, posters, résumés, brochures, graphics, infographics, and other forms of learning media (Azdy et al., 2023). The Canva application has the potential to facilitate the process of designing learning media, such as teaching materials, for educators. According to Rukman et al. (2022), the Canva application has the potential to assist educators in the creation of learning media that effectively utilizes technology, fostering skills and creativity. The integration of Canva learning media enhances the appeal of educational activities, particularly in the context of multimedia learning.

Previous research on the application of snake and ladder games to integer operations has been done before, such as the application of snake and ladder games by combining with integer counting operation materials using concrete media of snake and ladder boards (Indriani et al., 2020). In the study, it was explained that the snake and ladder game can be used as a new experience in mathematics learning and the results of the research show that the application of snake and ladder media is able to provide good achievements where student scores increase. In addition, there is research related to the development of learning media based on snake and ladder games modified with monopoly games in the form of cards (Fajriah et al., 2022). In the study, it was explained that monopoly snake and ladder media is categorized as very good as used as mathematics learning media in elementary schools, especially in integer material. The results of previous research explain that the snake and ladder game can be combined with mathematics learning, especially integers, and the research of Wasiatil Ilmiyah and Tri Wahyuningtyas, (2024) which implements the snake and ladder game using concrete media where each snake and ladder box is given the concept of place value and question questions about place value. In his research, he explained that snake and ladder media is very valid for use in mathematics learning to provide many benefits, there are 11 benefits described in his research such as: creating a fun and exciting atmosphere, students are not sleepy, not bored, want to continue learning, more enthusiastic about learning, ready and active in learning.

Preliminary studies have indicated that the media associated with snake and ladder games is typically confined to concrete media or played in a direct, manual-based manner. This restriction on media access is further compounded by limitations in terms of location and time. It must be noted that certain limitations are associated with the manual implementation of snakes and ladders. Specifically, a suitable storage medium is imperative to prevent the disarray of the game's components. The incompleteness of snake and ladder media games has been demonstrated to impede the effective delivery of mathematics education, as well as the cancellation of these games. Therefore, the objective of this study is to develop a website-based snake and ladder game media. To that end, the study employs Adobe Animate and Canva applications, which can be accessed through internet technology. The result is a media platform that is accessible anywhere and at any time. Website-based snake and ladder games are also characterized by their ease of use, which is further facilitated by the absence of storage media requirements. The researcher developed interactive learning media, which enabled students to comprehend integer concepts through the implementation of snake and ladder games. These games were made possible by technological advancements that rendered the learning process more engaging and enjoyable. The advent of web-based snake and ladders math games has led to the prospect of enhancing pedagogical effectiveness and facilitating the comprehension of mathematical concepts, particularly integer material, which is frequently regarded as challenging for students. These web-based games offer an interactive and engaging learning environment, thereby enhancing the efficacy of educational initiatives in elementary schools.

2. Method

The type in this study uses research and development or R&D (Research and Development), used to make products and test their effectiveness. Research and development methods can be interpreted as a scientific way to research, design, produce and test the validity of the products produced (Sugiyono, 2013). There are many types of this research and feeding model. The model in this study uses a design developed by S. Thiagarajan, namely a 4D (four D) development model. The stages or design of the 4D development model consist of several stages, namely the defined, design, develop, and disseminate stages. The product produced is in the form of "Web-Based Snake and Ladders Math Go Games on Integer Materials in Grade IV Elementary School". The 4D model can be seen in Figure 1.



Figure 1. 4D development module

The development process at the define stage aims to determine and define learning needs by means of a systematic analysis of said needs and the collection of pertinent information. This process is carried out through five sequential steps: front-end analysis, learner analysis, task analysis, concept analysis, and the specification of instructional objectives. The design stage involves the planning of web-based versions of snake and ladders, incorporating the use of the Canva application and the Adobe Animate application. This process is methodically structured into four distinct phases: the initial phase encompasses the preparation of standardized tests, the selection of media, the selection of format, and the initial design. In the developmental stage, the researcher created the preliminary version of the product according to the plan, namely the creation of a web-based snake and ladders math game media product. The products that have been developed will undergo a series of validation tests and limited trials to assess their feasibility. The validation test was carried out by media and material experts, and the limited trial was carried out by 10 grade IV students. The next stage is carried out after the product is revised based on input from media experts and material experts, namely the field trial stage which is carried out by providing web-based snake and ladders math go media games in the form of links to grade IV students. The products that have been developed will be tested for effectiveness through pre-test and post-test.

The subjects of this research are 10 elementary school grade IV students. This research and development not only produces products, but also tests their feasibility, practicality, and effectiveness so that web-based snake and ladders math go games media can be used in learning in grade IV of elementary school. The data collection and analysis techniques used in this study can be seen in Table 1

Table 1. Data collection and analysis techniques

Quantitative	Qualitative
Quantitative analysis used validation results from product feasibility tests, results of student response questionnaires, product practicality test results, and product effectiveness test results for development products in the form of web-based media games's snake and ladders math go.	The qualitative analysis uses the results of interviews conducted by the researcher with teachers and students, as well as criticism and suggestions from validation tests and feasibility tests.

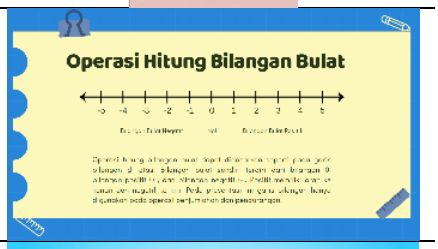
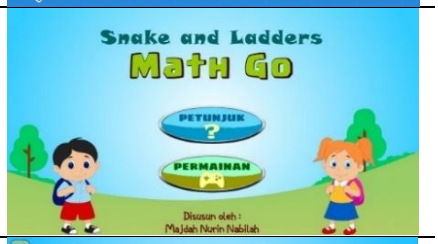
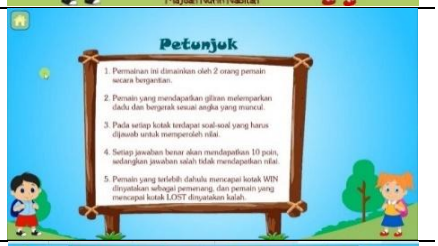
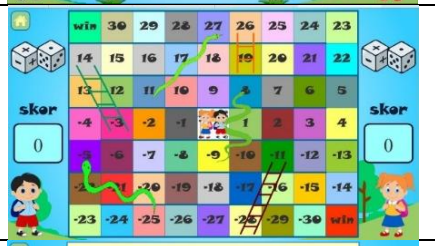
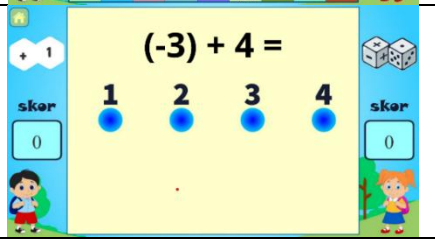
The research instrument employed in this study encompasses a series of methodologies, including in-depth interviews, validation sheets from media and material experts, and questionnaires. The objective of these instruments is to ascertain students' responses to products. Prior to the initiation of the product trial, students are administered a series of pre-test questions, and subsequently, post-test questions are administered following the conclusion of the trial. The two aforementioned tests have been validated by material and media experts, respectively. The tests have been revised in accordance with the recommendations provided by the validators. The objective of administering pre-tests and post-tests is to evaluate the efficacy of the developed products. In the validation and response questionnaire of students, the Likert scale answer criteria were employed. The Likert scale has the capacity to provide alternative responses to instrument questions, with excellent to poor interpretation. The validation test was carried out by one media validator and one material validator, who was a lecturer. To analyze the increase in student learning outcomes, the N-gain formula is employed.

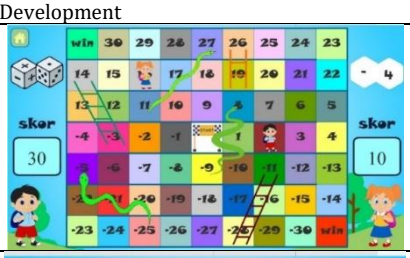
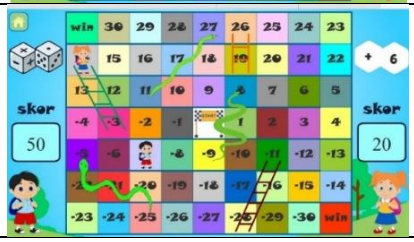
3. Results and Discussion

Based on the problems that exist in the school, at the definition stage, the researcher chooses integer counting operations material that will be used to develop web-based snake and ladders math go media games. Problems that arise in schools where the use of technological devices such as laptops, computers and LCD Projectors is still not optimally utilized in mathematics learning. Teachers tend to use concrete media and other conventional media. In the mistakes that arise in mathematics learning, especially integers, many students are not able to do well and tend that students are not thorough in distinguishing positive and negative numbers,

they only have a limited understanding that mathematics involves numbers, symbols, and formulas. This condition makes them less motivated and find it difficult in the mathematics learning process. So it needs media that can make students more focused and meticulous. The homeroom teacher also explained the characteristics of grade IV students, students like media-related games, students tend to be active and enjoy working in groups. To develop web-based snake and ladders math go media games, researchers conducted feasibility tests, effectiveness tests, and practicality tests. At the time of validation, the researcher first designed web-based snake and ladders math go media games At this stage, the researcher made an initial design of web-based snake and ladders math go media games for grade VI elementary school students which can be seen in Table 2

Table 2. Electronic Module Design

Steps	Development
Home Page The initial display of the web-based media games snake and ladders math go which presents navigation to various main features such as materials and games.	
Material There is integer material in the web-based snake and ladders math go games media to study the material before playing.	
Game page There are two navigations in the game, game instructions and gameplay	
Game instructions Provides a guide to using the web-based media games snake and ladders math go.	
Play Students will play web-based snake and ladders math go media games with the rules that have been explained, at the beginning students will roll the dice to find out the steps they will take.	
Practice questions There are questions in each box of the web-based snake and ladders math go media game, students will answer by getting 10 points if they are correct.	

Steps	Development
Play Students will play in turns to increase their score.	
Finish Students race towards the win box, there are two-win boxes, positive win and negative win.	

Link: https://weddinginvt2.my.canva.site/games-snake-and-ladders-math-go

The development stage is carried out through a product validation process involving material experts and media experts. The results of validation by material experts along with the web-based snake and ladders math go media category are listed in Table 3.

Table 3. Results of material expert validation of web-based snake and ladders math go game media

No	Aspect	Value	Category
1	Learning Design	86%	Very Feasible
2	Content Aspect	87%	Very Feasible
	Mean	87%	Very Feasible

Based on Table 3validation by material experts on e-modules shows 87% with a very feasible category. The results of validation by media experts along with the category of web-based snake and ladders math go media games can be seen in Table 4

Table 4. Results of media expert validation of media along with the category of web-based snake and ladders math go media games

No	Aspect	Value	Category
1	Navigation Design	86,66%	Very Feasible
2	Writing	94,28%	Very Feasible
3	Media Presentation	93,33%	Very Feasible
	Mean	**97,30%**	Very Feasible

Based on Table 4 it can be seen that the validation by media experts of the e-module reached 97.30%, with a very feasible category. Furthermore, the dissemination stage was carried out by giving a pre-test before the product trial, and a post-test after the product trial. The pre-test and post-test were given to determine the increase in student learning outcomes before and after using the computational thinking e-module. The results of improving student learning outcomes through pre-test and post-test can be seen in
Figure 2

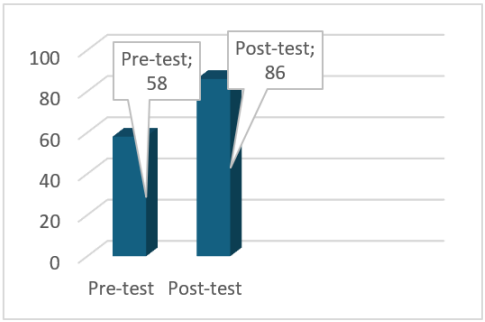


Figure 2. Pre-test and Post-Test Improvement Results

Based on

Figure 2 student learning outcomes seen from the pre-test and post-test results increased by 28% with an average N-gain of 0.72 The categorization of the effectiveness of the N-gain average with a percentage of $g \leq 0$ is included in the failure category, $0 < g < 0.3$ is included in the low category, $0.3 \leq g \leq 0.7$ is included in the medium category, and $g > 0.7$ is included in the high category. Based on the analysis of the improvement of student learning outcomes, the average effectiveness of N-gain is 0.725 which is included in the high category. Based on the analysis of the increase in student learning outcomes, the average effectiveness of N-Gain is 0.72 which is included in the high category. The effectiveness of snake and ladders math go media games based on web strengthening exercises on integer operations to improve learning outcomes can be seen in Figure 3.

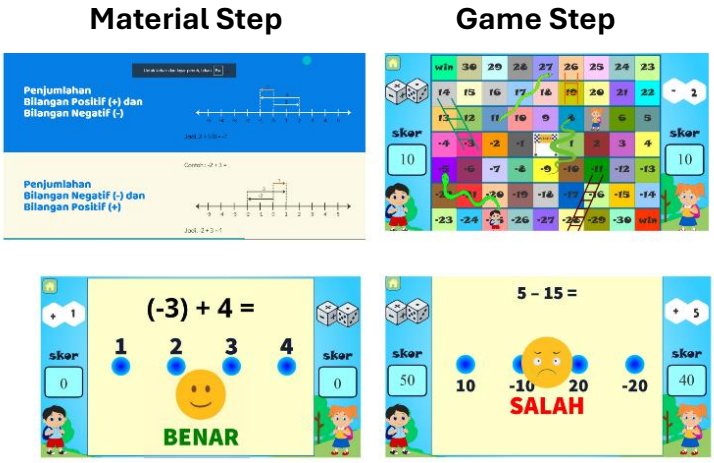


Figure 3. Stages of playing when using the Web-Based Media Games Snake and Ladders math Go

Based on Figure 3, students can learn integer counting operation material using web-based snake and ladders math go media games. The first stage of students studying integer material in the media games to get to know more about integer material, stage. Next, students enter the game stage, before entering the core of the game students will go through the stage of reading the game instructions, students will find out how to play snake and ladders math go web-based media games. after students understand the rules of the game, students will play snake and ladders math go web-based media games, where the game board consists of 63 boxes with zero in the middle, students will start the game by shaking the dice first to determine the course of the pawn. Each box in this web-based snake and ladders math go media game contains questions about integer counting operations, students will answer these questions to be able to continue the game. Each correct answer students will get 10 points, and if wrong do not get points, at this stage students who were initially in a hurry to reach the finish, they seem to be more careful in answering questions in order to get a lot of points. The last stage is finish, the game will end in the win box, there are two-win boxes in the web-based snake and ladders math go media games, namely negative win and positive win.

Based on Figure 3 from a series of game processes that have been presented, students can play games well. And the results of the practicality assessment of the student response questionnaire to the web-based snake and ladders math go media games can be seen in Figure 4

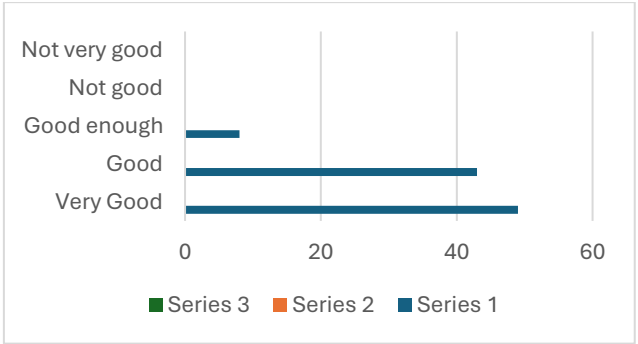


Figure 4. Results of the Learner Response Questionnaire to the Web-Based Snake and Ladders math Go Media Games

Based on Figure 4, the results of the student response questionnaire to the web-based snake and ladders math go media games reached 88% with a very good category. There are 49 aspects of practicality chosen by students in the excellent category, and 43 aspects of practicality chosen by students in the good category. A total

of 8 aspects of practicality were chosen by students in the sufficient category, and no aspects of practicality were chosen by students in the not good and very bad categories.

The model employed in this study draws from a design developed by S. Thiagarajan, namely a 4D development model. In the define stage, researchers determine and define learning needs by analyzing needs and collecting information to determine the extent to which development needs to be carried out (Hikmawati, 2020). This stage comprises five primary steps: Front-end Analysis, Leaner Analysis, Task Analysis, Concept Analysis, and Specifying Instructional Objectives. In the preliminary analysis, the researcher must identify and ascertain the basis of the problem faced. A series of issues were identified in the learning process. These issues were revealed through interviews with grade IV teachers. It was determined that the use of technology, such as laptops, computers, and LCD projectors, is not being utilized to its full potential in mathematics learning. In the student analysis, the researcher will identify the students' characteristics in relation to the learning material. The objective of this analysis is to ascertain the students' abilities, learning experiences, academic aptitudes, cognitive development, motivation, and individual skills. The results of the interview with the fourth grade teacher indicated that students generally exhibited active and enthusiastic dispositions, particularly in regard to collaborative learning activities. As Fernandiana et al. (n.d.) have previously indicated, a number of characteristics have been identified among a subset of elementary school students. These characteristics include a propensity for physical activity, a love of collaborative work, and a preference for direct experiences or sensations. Researchers must develop media that is capable of creating more engaging, entertaining, and varied learning experiences, aligning with students' needs while leveraging existing technology (NurHikma et al., 2023). During the task analysis stage, the researcher examines material that is challenging for students to comprehend. At the concept analysis stage, the researcher will be adjusted to the competencies to be achieved by identifying and arranging learning materials in an appropriate systematic manner (Putra et al., 2020). In the process of formulating learning objectives, the researcher establishes learning outcomes in alignment with these objectives, ensuring that the content of the developed media is conducive to achieving the learning goals.

At the design stage, it is done to design web-based snake and ladders math go media games that will be developed in mathematics learning. This design includes the preparation of test standards (Rajagukguk et al., 2021), researchers will prepare test instruments with integer counting operation materials in accordance with the learning objectives. The selection of products will be carried out to produce the media to be developed, while the selection of formats is carried out to design products consisting of the selection of backgrounds, colors, images, fonts, music, and the selection of components that contain identities and materials (Sidabutar et al., 2022). Initial design, the researcher will compile web-based snake and ladders math go media games through adobe animate and Canva applications.

In the developmental stage, the researcher produced a web-based snake and ladders math game. This game was created using a collaboration between the Adobe Animate and Canva platforms. The researcher populated the game with mathematical material in the form of integer counting operations. The web-based snake and ladders math games have been meticulously designed to be straightforward and engaging for grade IV elementary school students. These games incorporate educational components into the traditional snake and ladder games, leveraging vibrant colors to enhance their appeal and facilitate learning. According to Hikmawati (2020), the following steps are taken during the development stage: The process of validation is initiated by media and material experts, who provide feedback and suggestions. These insights are then incorporated into subsequent revisions. Following this, a limited number of trials are conducted to assess the effectiveness of the revised material. The results of these trials inform subsequent revisions, ensuring the refinement of the material. Finally, the implementation of the material in various media is conducted, involving wider trials to evaluate its performance in different contexts. A validity test was conducted by material and media experts to obtain input and an assessment. The test yielded an assessment in the feasible category. The web-based snake and ladders math game has undergone a series of modifications in accordance with the recommendations and contributions of experts in the field. This revised version of the game is currently undergoing a phase of experimental testing with students. In the validity test of web-based snake and ladders math go media games, recommendations have been made for improvements, including the addition of logos on the cover and supplementary material. Concurrent with the aforementioned efforts, the validity of web-based snake and ladders math games as media materials has been assessed. This assessment yielded recommendations and contributions concerning the development of supplementary materials, which would broaden the scope of the materials beyond those available on YouTube.

At the dissemination stage, web-based snake and ladders math games were distributed to grade IV elementary school students to ascertain the effectiveness of this media in helping them understand integer material. Additionally, web-based versions of traditional games such as snakes and ladders, which have been adapted for educational purposes, are available at no cost to students and teachers seeking to augment their learning experience with multimedia resources created by researchers. The results of the student questionnaire were classified as "very good." This finding aligns with the conclusions of research that determined the Snake and Ladder game to be a suitable complement to material focused on integer counting operations (Umurohmi & Purwanti, 2022).

This finding indicates the efficacy and practicality of web-based snake and ladders math games in enhancing student learning outcomes. The final stage of the product development process is product dissemination, which encompasses diffusion and adoption. At this stage, the objective is to promote web-based snake and ladders math games that will be accepted by users or other individuals. At the stage of media dissemination, it is both rare and important for the usefulness of media and for the means of continuous improvement for other researchers (Purwanti et al., 2022). A field trial was conducted, and a pre-test and post-test were administered following the implementation of web-based snake and ladders math games. The objective of this evaluation was to ascertain the effectiveness of the games and to obtain results in the high category. This improvement can be observed through enhanced student comprehension as evidenced by post-test results. As posited by Widiana et al. (2019), the objective of game media is twofold: first, to eliminate the monotony that often accompanies the learning process, and second, to engender an atmosphere conducive to teaching and learning through its engaging nature. In the course of the field trial process, students employed web-based snake and ladders math games with the assistance of researchers who provided guidance on how to play the media. From the outset, students exhibited a sense of enjoyment and displayed enthusiasm, leading to their pawns attaining the finish line first. By engaging in the exercises within each section, students demonstrate a heightened level of meticulousness in their responses, thereby accruing points. The utilization of web-based snake and ladders math games has been demonstrated to promote active student participation, enabling them to progress at their own pace while fostering a sense of autonomy. Consequently, it can be concluded that web-based snake and ladders math games have the potential to support mathematics learning, including integer calculation operation material.

4. Conclusion

Web-based snake and ladders math games have been found to demonstrate excellent classification. The results of the validation process conducted by material and media experts have been determined to fall within the "very feasible" category. The results of the practicality of the student response questionnaire in the tunggi category were very good, as well as an increase in the results of the pre-test, post-test, and average N-Gain. The present study demonstrates the viability, pragmatism, and efficacy of web-based snake and ladders math games in supporting the learning of integer material in grade IV of elementary school.

Author Contributions

All authors have equal contributions to the paper. All the authors have read and approved the final manuscript.

Funding

No funding support was received.

Declaration of Conflicting Interests

The author declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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