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Scratch-Assisted Interactive Learning Media for Fraction Learning: A Development Study on Fourth-Grade Students' Mathematical Representation Skills

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Abstract: This study aims to develop interactive learning media based on the Scratch website, designed according to the learning needs and mathematical representation abilities of fourth-grade elementary school students on the topic of fractions. Employing a Research and Development (R&D) framework using the ADDIE model, the study focused on the design, expert validation, and formative evaluation stages. The participants consisted of 51 students and 11 teachers from SDN Manyaran 02, Semarang, Central Java, involved in the limited implementation phase. The instruments used included a needs analysis questionnaire, content expert and media expert validation sheets, teacher and student response questionnaires, and documentation of student quiz results. The data were analyzed using both quantitative and qualitative approaches. The results showed that the developed media obtained a content expert validation score of 92.3% and a media expert validation score of 98%, both categorized as highly suitable. During the limited implementation phase, the teacher response rate reached 93%, while the student response rate reached 91.5%, both of which fell into the "highly suitable" category. Furthermore, the distribution of student quiz scores indicated positive learning outcomes, with an average score of 89.02. These findings suggest that the Scratch-based learning media aligns with students' learning needs, is practical to implement, and has the potential to support the enhancement of mathematical representation abilities among elementary school students.

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Introduction

The learning process is an interaction between teachers and students aimed at effectively achieving learning objectives. Under the Merdeka Curriculum, learning is expected to be flexible, interactive, and contextual, tailored to students' characteristics and learning outcomes (Ariga & Wahab, 2023). In this context, mathematics plays a crucial role because it not only hones computational skills but also develops logical, critical, and creative thinking, as well as problem-solving abilities. However, many students still struggle to grasp mathematical concepts deeply (Faujiah & Nurafni, 2022). In fact, meaningful learning requires a connection between new information and the cognitive structures students already possess (Diputera et al., 2024). One important indicator of such meaningful learning is the development of students' mathematical abilities.

One mathematical ability that is important to develop starting in elementary school is mathematical representation. According to the NCTM (National Council of Teachers of Mathematics), foundational mathematical skills include problem-solving, reasoning, communication, connections, and representation (Addawiyah & Basuki, 2022). Mathematical representation skills are important because they help students present mathematical ideas in

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the form of pictures, symbols, tables, diagrams, or other models so that abstract concepts are easier to understand and problems can be solved systematically (Fitri & Anas, 2024; Bagus et al., 2025). Mathematical representation skills are one of the key competencies in mathematics learning as they help students understand and communicate mathematical concepts through various forms, such as visual, symbolic, and verbal representations. Based on research (Putra et al., 2023), mathematical representation skills can be enhanced through the use of technology and interactive learning media, as well as the implementation of innovative learning models such as Problem-Based Learning and Realistic Mathematics Education. Additionally, Lutfi and Juandi (2023) state that mathematical representation skills are also influenced by students' internal factors such as self-confidence and cognitive styles.

Other studies indicate that students' mathematical representation skills remain relatively low, particularly in transforming representations (Mellisa et al., 2023) and among elementary school students who still struggle with solving word problems and contextual problems (Dewi & Sulistiowati, 2025). These issues were also observed among fourth-grade students at SDN Manyaran 02. Results from observations, interviews, and pre-tests indicated that students still struggle to understand fraction concepts, particularly distinguishing between numerators and denominators, ordering and comparing fractions, and converting word problems into visual and symbolic representations. Furthermore, instruction remains largely teacher-centered, the media used are not sufficiently interactive, and the use of technology in mathematics instruction remains limited (Haryudita & Noer, 2024). These conditions highlight the need for instructional media capable of helping students understand fraction concepts in a more concrete, visual, and interactive manner.

At the elementary school level, mathematics instruction must be adapted to students' cognitive developmental stages. Therefore, fraction instruction should be supported by media that help students visualize the relationship between abstract concepts and visual representations. Research indicates that visual media can enhance understanding of fraction concepts and reduce misconceptions (Distira et al., 2025; Ismaimuza, 2025). Additionally, interactive learning media have been proven to enhance students' attention, motivation, and engagement through two-way communication between the user and the media (Syarifuddin & Utari, 2022). The combination of images, sound, animation, and interactivity can also help students build a more meaningful understanding of concepts (Simorangkir et al., 2024).

One medium with potential for use is the Scratch website. Scratch enables the development of learning materials in the form of animations, simulations, educational games, and interactive quizzes, allowing mathematical concepts to be presented in a more engaging and easily understandable manner. Several studies indicate that the use of the Scratch website in mathematics instruction can enhance students' interest in learning, active engagement, and thinking skills (Chaerunnisa & Bernard, 2021; Khalil & Wardana, 2022; Fitriani & Yahfizham, 2024).

Observations in fourth-grade classrooms reveal a gap between curriculum requirements and the reality of mathematics instruction in the classroom. Although teachers have utilized LCD projectors and instructional videos in accordance with the Merdeka Curriculum, the learning process remains dominated by lecture-based methods and one-way communication, resulting in students tending to be passive. Of the 51 students observed, many still struggled to distinguish between numerators and denominators, order fractions, and convert word problems into diagrams or mathematical symbols. Teacher interviews also revealed that the digital media used is still limited to presentations and instructional videos, so students spend more time watching rather than actively constructing mathematical concepts through interaction, simulation, or visual manipulation. These conditions indicate

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that the use of instructional media in schools does not yet fully support the implementation of interactive and constructive mathematics learning as required by the 21st-century curriculum.

However, the development of interactive learning media based on the Scratch website specifically tailored to the mathematical representation abilities of fourth-grade elementary school students on the topic of fractions remains limited. Therefore, this study aims to develop Scratch-based interactive learning media tailored to the mathematical representation abilities of fourth-grade elementary school students, assess the media's feasibility through validation by subject matter experts and media experts, and describe the implementation results through teacher feedback, student feedback, and student learning achievement scores.

Research Method

This study employs the Research and Development (R&D) method using the ADDIE model, which comprises analysis, design, development, implementation, and evaluation. Situmeang et al. (2022) explain that research and development is a type of research aimed at producing a product through a specific procedure that begins with needs analysis, continues with the development process, and concludes with evaluation. The Analysis stage includes needs analysis, analysis of student characteristics, and a review of relevant materials for achieving the desired competencies. The Design stage focuses on designing the framework of the media to be developed. The Development stage focuses on validation by subject matter experts and media experts, while the Implementation stage focuses on teacher responses, student responses, and documentation of student quiz scores.

The research was conducted at SDN Manyaran 02 during the odd semester of the 2025/2026 academic year. Participants were selected using purposive sampling, involving 51 fourth-grade students (Age 9-10) and 11 elementary teachers. The product developed was an interactive learning medium based on the Scratch website covering equivalent fractions as well as tenths and hundredths. The research instruments included a student needs questionnaire, a teacher needs questionnaire, a subject matter expert validation form, a media expert validation form, a teacher response questionnaire, a student response questionnaire, and documentation of student quiz scores. The content validity of the instrument was tested using Aiken's V based on evaluations by subject matter experts and media experts to determine the degree to which each item of the instrument aligns with the research objectives and the aspects to be measured, as well as its clarity and appropriateness. Data were analyzed using quantitative descriptive methods by converting scores into percentages. Data obtained from the content expert validation questionnaires, media expert validation questionnaires, teacher response questionnaires, and student response questionnaires were analyzed using a Likert scale. The Likert scale is used to measure the attitudes, opinions, and perceptions of an individual or a group of people toward a social phenomenon (Sugiyono, 2023). In this study, the Likert scale was used to measure respondents' evaluations of the developed learning media. The feasibility criteria used were as follows: 80%–100% highly feasible, 60%–<80% feasible, 40%–<60% somewhat feasible, 20%–<40% less feasible, and 0%–<20% highly less feasible (Hapsari & Fahmi, 2021).

Results and Discussion

Define: Analysis of Conditions and Needs

The analysis phase revealed that fourth-grade students at SDN Manyaran 02 still struggle with fractions, particularly in distinguishing between numerators and denominators, converting word problems into mathematical expressions, and representing fractions in visual and symbolic forms. Additionally, instruction remains teacher-centered, and the use of

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technology-based media is still limited. These conditions underscore the need for interactive, visual, and contextual learning media. The objective of the analysis phase is to identify the needs of both students and teachers regarding the use of learning media that is more engaging, interactive, and capable of helping students understand fraction concepts based on their mathematical representation skills.

The analysis phase yielded results encompassing: an analysis of student needs and an analysis of teacher needs. Through planned learning activities, students are expected to develop various mathematical skills, one of which is mathematical representation ability (Ahmad, 2023; Lestari et al., 2024). Based on the analysis of student needs obtained through the distribution of a student needs questionnaire, it was found that students require interactive learning media, equipped with visualizations of images and animations, featuring clear solution steps, and providing contextual practice problems to support students' mathematical representation skills regarding fraction material (Kartina et al., 2025; Haryudita & Noer, 2024).

Table 1. Summary of Students' Needs Regarding the Scratch Website

No	Aspect	Average Percentage
1	The need to understand the material and story problems	**80,5%**
2	Interest in interactive visual media	**90%**
3	The need for a clear learning structure	**96,0%**
4	The need for support in the form of visual representations and contextual practice problems	**86%**

Table 1 shows that 80.5% of students reported still frequently having difficulty solving fraction problems, particularly in word problems. In terms of the use of learning media, 90% of students tended to be more interested in learning mathematics through interactive visual media such as images (92%) and animations (88%) incorporated into quizzes. They tended to be able to solve fraction problems easily when presented in the form of images. In addition, 96% of students stated that learning media should also be tailored to the need for a clear learning structure, such as including clear learning objectives, step-by-step solutions to word problems, and clear voice-over explanations. A total of 86% of students also require support for visual and symbolic representations, as well as contextual practice problems, in their learning, such as engaging visuals to prevent boredom and a variety of contextual practice problems.

Table 2. Summary of Teachers' Needs Regarding the Scratch Website

No	Aspect	Percentage
1	Need for interactive media to motivate learning	**100%**
2	Need for media features (steps, exercises, visual-audio-text combinations)	**90%**
3	Technical preferences for media use	**85%**
4	Need to strengthen mathematical representation	**90%**

Based on Table 2, 100% of teachers agree that fraction instruction requires interactive media to motivate students and make learning fractions more engaging. This aligns with research indicating that the use of technology-based interactive learning media can enhance learning motivation and help students understand mathematical concepts through various forms of visual and symbolic representations during the learning process (Haryudita & Noer, 2024; Lestari et al., 2024). A total of 90% of teachers also stated that features such as audio-visual combinations, step-by-step problem-solving demonstrations, and varied contextual exercises to assess student understanding are also needed within the Scratch website

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platform. Based on usage aspects, 85% of teachers stated that the Scratch learning platform is generally more suitable for use on a laptop compared to a smartphone, although it can be implemented on both devices.

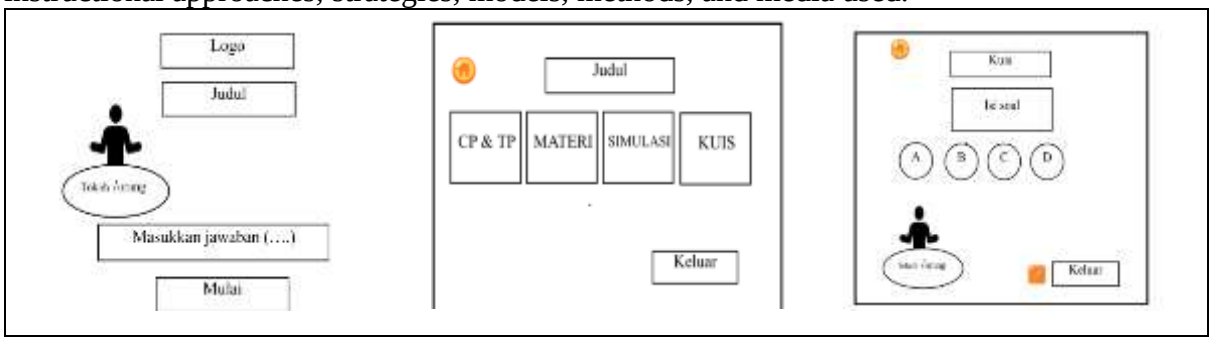
Design

The design phase produces a media design based on the results of needs analysis, the curriculum, and student characteristics. In this phase, the structure of the PANDESA (Learning Equivalent Fractions and Decimal Fractions with Scratch) media and the framework to be developed were designed. The media design includes determining learning outcomes and objectives, developing instructional materials, drafting the RPPM (Module Implementation Plan), designing the media, creating the media interface (character animations, voice-overs, and navigation buttons), simulations, and quizzes.

Table 3. RPPM Details

Component	First Meeting	Second Meeting
Content	Equivalent Fractions	Decimal Fractions: Tenths and Hundredths
Approach	*Deep Learning*, saintific 6C	*Deep Learning*, saintific 6C
Strategy	*Student Centered Learning*	*Student Centered Learning*
Model	*Problem Based Learning*	*Problem Based Learning*
Method	Ceramah, Demonstrasi, Diskusi Kelompok, Tanya Jawab	Lectures, Demonstrations, Group Discussions, Q&A Sessions
Media	Lectures, Demonstrations, Discussions	Website Scracth MIT.EDU

Table 3 presents details of the RPPM, including the differences and similarities in the instructional components of the first and second sessions, such as the content taught, instructional approaches, strategies, models, methods, and media used.



(a) (b) (c)

Figure 1. Initial Media Display (a), Main Menu for Each Session (b), Core Section of the Quiz Menu and Quiz Results (c)

Based on Figure 1, view (a) shows the home page of the Scratch-based interactive learning platform, which includes key elements such as the logo, title, user identity, and a name input field for initial access before beginning the learning process. This view serves as the main gateway directing users to subsequent features. View (b) illustrates the main menu for each session, which is systematically designed to provide several features: learning outcomes and objectives (CP & TP), materials, simulations, and quizzes. This menu structure supports organized navigation and facilitates students' gradual access to learning content. Furthermore, view (c) is the core part of the quiz menu, containing multiple-choice questions, answer options, and navigation features to continue or end the quiz, designed to support interaction and evaluation of student understanding.

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Development

The development phase focused on product development and validation by subject matter experts and media experts. The subject matter expert validation results achieved a 92.3% score in the "highly suitable" category, indicating that the media content aligns with the learning objectives, student needs, and mathematical representation skills. The media expert validation results achieved a 98% score in the "highly suitable" category, indicating that the media's visual presentation, interactivity, navigation, and ease of use are excellent. Revisions were made based on validator feedback, such as adding content examples, improving the help guide, and refining the appearance. Thus, the development phase confirms that the media is suitable for use based on the results of the subject matter expert and media expert validations. The development phase focuses on product creation, subject matter expert validation, media expert validation, and product revision.

Table 4. Results of Subject Matter Expert Validation

Aspect	Indicator	Score	Percentage
Appropriateness of the material	Alignment of the material with learning outcomes, learning objectives, and students' mathematical representation skills Relevance of the material to students' learning experiences	18	90%
Suitability of the material	Consideration of the material in light of students' characteristics and needs Ease of understanding the material Systematic structure and sequence of material presentation	15	100%
Usefulness of the material	Impact of material presentation on student motivation and understanding	8	80%
Language quality of the material	Clarity of language Appropriateness of sentences	9	90%
Functional value	Interactive visualization Building students' understanding through meaningful learning experiences.	10	100%
Average percentage = 92,3%			
Category = highly recommended			

According to Table 4, the expert validation score for the content reached 92.3%, falling into the "highly acceptable" category. The evaluation covered the following aspects: content appropriateness, content suitability, content usefulness, language quality, and functional value.

Table 5. Results of Media Expert Validation

Aspect	Indicator	Score	Percentage
Media Suitability	The suitability of media for learning objectives, student needs, and circumstances The effectiveness of media in promoting students' mathematical representations	20	100%
Appearance	Design Images Animation Audio (sound effects) Interactive storytelling	35	100%

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	Visual appeal Appropriate font selection for readability		
Characteristics of Scratch-Based Web-Based Learning Media	Interactivity in the simulation and quiz menus Illustrations Ease of navigation Feedback	19	95%
Usage	Use of media by teachers and students Flexibility (can be used independently or with guidance)	14	93%
Commercial Value	The suitability of media for commercial use based on user needs and media characteristics	10	100%
Average percentage = 98%			
Category = highly recommended			

According to Table 5, the results of the media expert validation reached 98%, falling into the "highly suitable" category. The assessment covered aspects of media suitability, appearance, media characteristics, usage, and commercial value. At this stage, the media and content experts also provided improvement suggestions to the researchers. The design revisions aimed to minimize shortcomings by adjusting the design. The following are the improvement suggestions from both experts.

Suggestions and Improvements from Media Experts

The media experts provided several recommendations to improve PANDESA as a Scratch-based web-based learning medium in its guidebook. The following are some of the improvements that have been made.

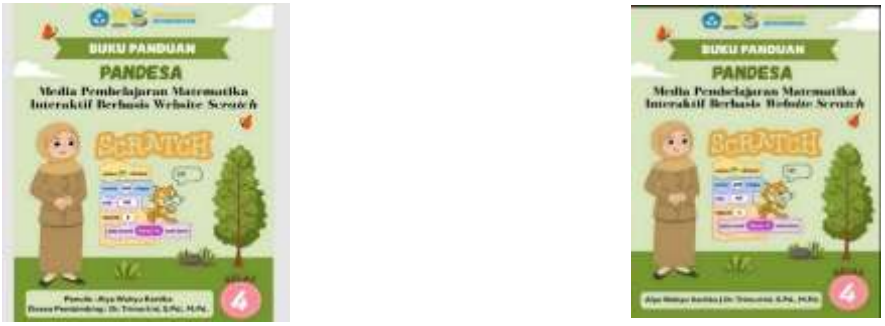

Figure 2. Cover page before revision (a), Cover page after revision (b)

Based on Figure 2, media experts recommend removing the terms "author" and "advisor" from the cover of the guidebook and correcting the words that should be italicized.

Figure 3. Cover page before revision (a), Cover page after revision (b)

Based on Figure 3, media experts recommend correcting the terminology used in the guidebook. Accordingly, the term "QR CODE" has been changed to "BARCODE."

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Suggestions and Corrections from Subject Matter Experts

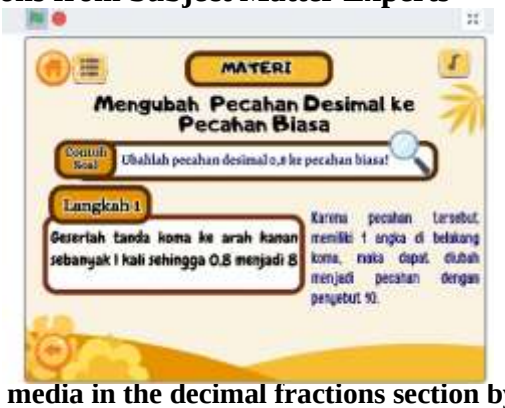

Figure 4. Revision of the media in the decimal fractions section by adding contextual word problems.

Based on Figure 4, the display shows a revision of the media in the decimal fractions menu, which includes the subtopic of converting decimal fractions to proper fractions. Subject matter experts emphasize the importance of presenting contextual stories related to the topic of fractions. Therefore, as shown in Figure 4, story-based example problems have been added, complete with step-by-step solutions.

Implementation

The implementation phase was conducted as a limited implementation, rather than a small- or large-scale trial. During this phase, the media was used to gather teacher feedback, student feedback, and student scores. The results of the teacher feedback survey showed a 93% rating in the "highly suitable" category, while student feedback reached 91.5% in the "highly suitable" category. Additionally, student scores indicate good quiz results after using the media. This indicates that the media is not only deemed suitable by the validators but is also very well received by teachers and students during the limited implementation.

The implementation phase was conducted in the form of a limited implementation. During this phase, the media was used to gather teacher feedback, student feedback, and student scores. This activity involves both teachers and students in the process of using the media, during which students observe, try out, and interact directly with the media on display. The product exhibition also serves as a means to gather user feedback on the developed media, thereby supporting the evaluation of the media's practicality in mathematics instruction.

Table 6. Results of the Teacher Response Survey

No	Aspect	Percentage
1	Content appropriateness	94%
2	Presentation	93%
3	Language	90%
4	Media characteristics	94%
5	Usage	91%
6	Media function	94%
7	Commercial value	90%

Based on Table 6, the teachers' responses showed an overall percentage of 93% in the "highly appropriate" category.

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Table 7. Student Responses

No	Aspect	Percentage
1	Appearance	88%
2	Language	89%
3	Media characteristics	87,89%
4	Usage	87%
5	Media functions	89%

According to Table 7, the students' responses showed an overall percentage of 91.5% in the "highly appropriate" category.

Table 8. Percentage Students' Test Scores

Score /Value	Students' scores in mathematics before the implementation of the Scratch platform	Students' scores in mathematics after the implementation of the Scratch platform
100	7,84%	35,29%
90	31,37%	37,25%
80	31,37%	13,72%
70	13,72%	9,80%
60	15,68%	3,92%
The total number of students = 51		

According to Table 8, the data show an improvement in students' mathematics achievement following the use of Scratch-based learning media.

Evaluation

The evaluation phase is the final review of the entire development process. The evaluation showed that the media was designed based on the needs of the curriculum, teachers, and students; was deemed highly suitable by subject matter experts and media experts; and received an excellent response from teachers and students. Thus, the Scratch website developed has met the criteria of need, suitability, and user acceptance, making it suitable for use as an interactive learning medium to support the mathematical representation skills of fourth-grade elementary school students. The evaluation stage indicates that the developed media aligns with learning needs, has been deemed highly suitable by subject matter experts and media experts, and has received an excellent response from teachers and students.

Discussion

The findings of this study indicate a gap between the curriculum's emphasis on interactive and meaningful learning and mathematics teaching practices in the classroom, which still tend to be conventional. Although the Merdeka Curriculum emphasizes flexible, contextual, and learner-centered learning, its implementation has not yet been fully optimized (Hrp et al., 2022; Ariga & Wahab, 2023). This situation results in low conceptual understanding among students, particularly in the area of fractions, which requires mathematical representation skills. This finding aligns with Faujiah & Nurafni (2022), who state that students still face difficulties in deeply understanding mathematical concepts. Other studies also indicate that students' mathematical representation skills remain relatively low, particularly in converting between visual, symbolic, and verbal representations (Khaerun, N. R., & Zaenal, R. M., 2023). Furthermore, a literature review conducted by Lutfi and Juandi (2023) indicates that mathematical representation skills are influenced by various factors, such as instructional models, learning media, and student learning characteristics. Therefore, innovative learning approaches are needed to help students understand mathematical concepts in a more concrete and meaningful way.

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In response to these issues, the development of interactive learning media based on the Scratch website has emerged as a relevant alternative solution. This medium is designed to facilitate more concrete learning through the integration of visual elements, animations, and interactivity, thereby supporting meaningful learning processes. This aligns with the theory of meaningful learning, which emphasizes the importance of linking new knowledge to students' cognitive structures (Diputera et al., 2024). Thus, the use of interactive media can help students represent abstract concepts in a way that is easier to understand. Research by Olsson and Granberg (2022) shows that the use of Scratch in mathematics learning can help students build mathematical reasoning through visualization and interactive simulations. Furthermore, Scratch is effective in helping students understand coordinate systems through interactive visual representations, making abstract mathematical concepts more concrete and easier to grasp (Anabousy et al., 2023). These findings indicate that Scratch-based media has a strong connection to mathematical representation skills because it integrates visual, symbolic, and verbal representations in mathematics education.

The findings of this study are consistent with various international studies showing that Scratch is effective in mathematics education through a visual and interactive approach. Benton et al. (2018) explain that the use of Scratch in mathematics education helps students understand concepts through programming activities, visualization, and the manipulation of digital objects, thereby making abstract concepts more concrete. Additionally, Brennan and Resnick (2012) state that Scratch not only supports programming skills but also helps students develop computational thinking, reasoning, and representational skills through the process of creating animations, simulations, and interactive projects. Another study in the *International Journal of Child-Computer Interaction* also indicates that block-based programming environments like Scratch possess the characteristics of a "low floor and high ceiling"meaning they are easy for beginners to use while still supporting the exploration of more complex concepts (Blake-West & Bers, 2023). These findings reinforce the results of this study that the Scratch-based web platform can help students build a more active and meaningful understanding of mathematics through the integration of visual, symbolic, and verbal representations.

The media development process carried out indicates that the aspect of feasibility is a primary focus in ensuring the quality of the resulting product. Validation results from subject matter experts and media experts show that the developed media meets feasibility criteria in terms of content, appearance, and presentation. These findings underscore the importance of the validation process in the development of educational media to ensure it aligns with pedagogical standards and the needs of learners. This approach aligns with media development principles that emphasize continuous evaluation to produce high-quality products. Research on the development of Scratch-based media in mathematics education also indicates that Scratch-based media is deemed valid, practical, and effective for use in the learning process because it creates a more engaging and interactive learning environment (Khalil, N. A., & Wardana, M. R., 2022).

Furthermore, user feedback on the developed media indicates that it can be practically applied in learning. This practicality is demonstrated through ease of use, an appealing interface, and the media's ability to support students' learning activities. This reinforces previous findings that technology-based interactive media can enhance student engagement in the learning process (Ramadhan et al., 2023; Salamah et al., 2025). The use of interactive digital learning media can improve students' mathematical representation skills by presenting concepts simultaneously in visual, symbolic, and verbal forms. Additionally, technology-based learning media help students connect abstract concepts with more concrete learning

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experiences, thereby supporting a deeper understanding of mathematical concepts (Otniel, O., & Kurniadi, E., 2024). Thus, Scratch-based media hold potential as an adaptive learning tool tailored to the needs of elementary school students.

The findings of this study also reinforce previous research results indicating that the use of Scratch in learning can improve the quality of the learning process through a more interactive and exploratory approach (Pratiwi & Bernard, 2021; Khalil & Wardana, 2022). Recent research also indicates that Scratch can help students develop mathematical thinking skills through programming activities, visualization, and independent exploration of mathematical concepts (Olsson & Granberg, 2022; Anabousy et al., 2023). However, this study makes a more specific contribution by focusing on the development of a Scratch-based web-based learning medium oriented toward mathematical representation skills, specifically regarding fractions in elementary school.

Overall, this study confirms that the development of technology-based interactive learning media that has been tested for feasibility can serve as a solution to address the limitations of conventional learning. The media developed not only meets feasibility criteria but also provides an innovative alternative to support more meaningful and contextual mathematics learning. Thus, this study contributes to the development of learning media that is relevant to curriculum requirements and student needs in the digital age.

Conclusion

This study produced an interactive learning medium based on the Scratch website, developed according to the needs and mathematical representation abilities of fourth-grade elementary school students regarding fractions. The analysis phase revealed the need for an interactive medium capable of helping students understand word problems and mathematical representations in the topic of fractions, particularly equivalent fractions and decimals. The design phase produced a design that integrates CP, TP, instructional materials, teacher needs, and student needs. The development phase showed that the media is highly feasible based on validation by subject matter experts (92.3%) and media experts (98%). In the limited implementation phase, the media also received a “highly suitable” response from teachers (93%) and students (91.5%), supported by student quiz scores with an average of 89.02. The evaluation phase confirmed that the media aligns with learning needs and is practical for use as an alternative mathematics learning medium in elementary schools. The findings of this study indicate that the use of interactive learning media based on the Scratch website has broad potential for supporting mathematics learning in elementary schools, particularly for abstract topics such as fractions. The integration of visual elements, animations, and interactivity in this media can help students understand concepts more concretely and increase their engagement during the learning process.

Recommendation

Teachers and students can utilize the Scratch website-based learning platform as an alternative for teaching mathematics that is more interactive, varied, and engaging, particularly when covering fractions, thereby facilitating students’ understanding of mathematical concepts based on their mathematical representation skills. This development study is still limited to the media development and feasibility testing stages. Therefore, future researchers are encouraged to continue the study into the effectiveness testing or broader implementation stages to examine the media’s impact on improving students’ mathematical representation skills in elementary school mathematics instruction.

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