

Scratch-Based Animation Design on Students' Learning Interests at SMP Negeri 1 Dolok Sanggul in Informatics Subjects

Yusuf Ijonris^{1*}, Jimmy F. Naibaho², Sri Hasianna Sihombing³

Universitas Methodist Indonesia

Corresponding Author: Yusuf Ijonris yusufijonrispayung@gmail.com

ARTICLE INFO

Keywords: : Learning Animation, Scratch, Interest In Learning

Received : 5 December 2025

Revised : 22 January 2026

Accepted: 23 February 2026

©2026 Ijontris, Naibaho, Sihombing:
This is an open-access article distributed
under the terms of the [Creative Commons Atribusi 4.0 Internasional](https://creativecommons.org/licenses/by/4.0/).



ABSTRACT

This study aims to develop Scratch-based animation learning media to improve students' interest and learning outcomes in Informatics subjects at SMP Negeri 1 Doloksanggul. Animation media is designed so that Informatics materials are presented in an interesting, interactive, and easy-to-understand manner, thus creating a more enjoyable learning atmosphere. Through this animation, students can understand the basic concepts of Informatics and algorithm steps visually. The study used the Research and Development (R&D) method, starting from needs analysis, storyboard design, animation creation with Scratch, to trials on 32 students of class VIII-1. The results showed an increase in interest and learning outcomes, seen from the increase in the average pre-test and post-test scores with an increase percentage between 0% and 66.67%. Students also showed higher enthusiasm when using animation media. Thus, Scratch-based animation can be an effective, interesting, and innovative learning medium to improve the quality of Informatics learning at the junior high school level

INTRODUCTION

In informatics learning at the junior high school level, one of the challenges that often arises is low student interest in learning. Many students still view informatics as limited to theory or rigid technical skills, thus limiting their motivation to participate in lessons. In fact, informatics requires active involvement, creativity, and an integrated understanding of concepts. On the other hand, developments in educational technology have provided various interactive learning media, one of which is the use of Scratch as an animation platform. Scratch is designed with a visual, block-based approach, making it easier for students to understand programming logic while simultaneously channeling their creativity through animation.

However, the application of this media in the learning context at SMP Negeri 1 Dolok Sanggul has not been systematically implemented. A gap exists between the actual conditions in the field, where informatics learning still tends to use conventional and less interactive methods, and the potential of utilizing Scratch animation-based media, which can increase student learning interest. Various previous studies have shown that the use of Scratch-based learning media has been proven to increase student interest and understanding. For example, research at SMP Negeri 2 Delitua showed that the developed Scratch media was valid, practical, and effective in increasing student learning interest (Fadillah, 2022). A similar finding was also seen in research at SMP INBS Putra Cibirong, where Scratch-based training successfully increased students' average comprehension scores from 62.5 to 93.75 (Rahmawati, 2021).

Meanwhile, research at SMP Negeri 1 Semarang showed that Scratch-based media on global warming material was able to provide learning outcomes that exceeded the Minimum Completion Criteria (Sari, 2022). The results of this study prove that Scratch has great potential to arouse students' interest in learning while facilitating conceptual understanding. However, the application of this media in various regions is not evenly distributed, especially in Humbang Hasundutan Regency, North Sumatra. To date, there has been no research that specifically examines the use of Scratch-based animation in informatics learning at SMP Negeri 1 Dolok Sanggul.

Informatics is a crucial subject for students to understand, as learning requires not only material knowledge but also in-depth understanding through practical experience. Students have traditionally learned by relying solely on textbooks, without any practical application. Ideally, students at SMP Negeri 1 Doloksanggul would also experience enjoyable and interactive learning. However, based on initial observations, most students still show low interest in Informatics, characterized by low levels of questioning, a lack of initiative in trying practical exercises, and a tendency to be passive in participating in learning activities. This is because the presentation of the material is uninteresting and monotonous, resulting in students feeling bored and uninterested in Informatics.

In fact, the school already has sufficient facilities to support informatics learning. However, the utilization of these facilities has not been optimal because some teachers are still not up to date with developments in learning technology,

especially in the application of interactive animation media such as Scratch. In addition, there are still many teachers who do not understand the progress of the times, so they are less proficient in the use and application of modern technology in learning activities. This condition has created a gap between the potential of Scratch which has been proven effective in various schools and the reality at SMP Negeri 1 Dolok Sanggul, where this media has not been widely utilized. Therefore, research on "Scratch-Based Animation Design on Student Learning Interests at SMP Negeri 1 Dolok Sanggul" is important to conduct.

LITERATURE REVIEW

Research and Development

Research and Development (R&D) is a research method aimed at creating new products or improving existing ones through a systematic, data-driven process. According to Sugiyono (2019), R&D is a research process that produces new products, followed by validation, testing, and revision until the product is ready for use. This approach involves several stages, such as needs analysis, product design, testing, and evaluation. The product in question can be a physical object, a system, or a procedure.

Scratch Based Animation

Mega Ekka Hadi (2022-2023) in his research stated that Scratch is an open source visual programming platform, developed by the Lifelong Kindergarten Group at the MIT Media Lab, which uses the drag and drop method of code blocks to create animations, games, or interactive stories without having to write code manually. In line with that, Resnick et al. (2009) explained that Scratch was designed not only as a tool for learning programming, but also as a means for students to think creatively, work together, and develop problem-solving skills through the activity of creating animations and interactive projects. Each technique has different characteristics and can be adapted to learning materials to increase student interest and understanding.

Interest in Learning in Education

Interest in learning is a tendency or drive from within students to actively engage in the learning process, which includes curiosity, attention, motivation, and enjoyment in learning a material. Interest in learning is one of the important factors that determine students' success in achieving learning objectives. According to Haizatul Faizah and Rahmat Kamal (2024), interest in learning is a positive attitude that grows continuously, is active, and directed as a result of students' interactions with their learning environment. In line with that, Naniek Utami Handayani et al. (2023) explain that interest in learning includes students' attention, motivation, and involvement in learning activities as indicators of the achievement of educational goals. In other words, interest in learning is not only demonstrated through students' enthusiasm or activeness in class, but also through their consistency in paying attention, understanding the material, completing assignments, and fostering a sense of enjoyment in the learning process they undergo.

Learning Outcomes in Education

Learning outcomes are changes in abilities or behaviors that students possess after going through the learning process, which includes the cognitive (knowledge), affective (attitude), and psychomotor (skills) domains. Learning outcomes are an indicator of the extent to which the learning objectives designed by the teacher can be achieved by students. According to Haizatul Faizah and Rahmat Kamal (2024), learning outcomes are changes in behavior that occur continuously, are positive, active, and directed as a result of the interaction of students with their learning environment. In line with that, Naniek Utami Handayani et al. (2023) explain that learning outcomes are skills, knowledge, and attitudes that students must be able to demonstrate at the end of the learning process as measurable achievements from their learning experiences. In other words, learning outcomes are not only seen from grades or scores alone, but also from the extent to which students understand concepts, apply knowledge, cultivate positive attitudes, and develop skills relevant to real life.



Figure 1. Research Framework

METHODS

This research uses the Research and Development (R&D) method. The development process begins with the analysis stage, which involves identifying the needs of public students SMP Negeri 1 Doloksanggul, studying their characteristics and identifying issues related to their learning interests. At this stage, relevant learning materials to be packaged in animation were also determined.

The next stage is design. At this stage, an initial animation plan is developed, including a storyline, visual design, and indicators that can be used to assess student learning interest. This design serves as the basis for the development process. The next stage is the development phase, which involves creating a Scratch-based animation based on the previously developed design. The resulting product is then validated by subject matter and media experts to ensure the appropriateness of the content and presentation. Input from the validators is used as a basis for product improvements.

After that, the developed animation was implemented in classroom learning activities. A trial was conducted with students to determine their

response to the use of animation, as well as to measure learning interest using prepared instruments. The final stage was evaluation. Evaluation was conducted formatively during the trial process and summatively after the product was used. The results of this evaluation served as the basis for assessing the effectiveness of Scratch-based animation in increasing the learning interest of students at SMP Negeri 1 Doloksanggul.

RESULTS

Description of Research Results

Based on the results of research conducted on several class VIII students of SMP Negeri 1 Doloksanggul, pre-test and post-test score data were obtained to measure the effectiveness of using Scratch-based learning media in improving learning outcomes in Informatics subjects.

- Yunita experienced an increase from 60 to 100, with a percentage increase of 66.67%.
- Reigan increased from 70 to 100, with a percentage increase of 42.86%.
- Kevinzio also increased from 70 to 100, with the same percentage increase of 42.86%.
- Meri increased from 80 to 100, with a percentage increase of 25%.
- Leading increases from 80 to 100, with a percentage increase of 25%.

Based on the data above, it can be seen that all eighth-grade students who participated in learning using Scratch media experienced a significant increase in their grades. Students with low initial grades, such as Yunita and Reigan, showed the highest increase. This indicates that the use of Scratch-based learning media is more effective in helping students who previously experienced difficulties in understanding Informatics material. In addition to quantitatively increasing grades, learning using Scratch also has a positive impact on student motivation and engagement in the learning process.

Scratch-Based Learning Media Design

The design of Scratch-based learning media to increase students' interest in learning Informatics subjects at SMP Negeri 1 Doloksanggul aims to create a more interactive and enjoyable learning process.



Figure 2. Main Page View



Figure 3. Menu Contents Display



Figure 4. Display of Material Content

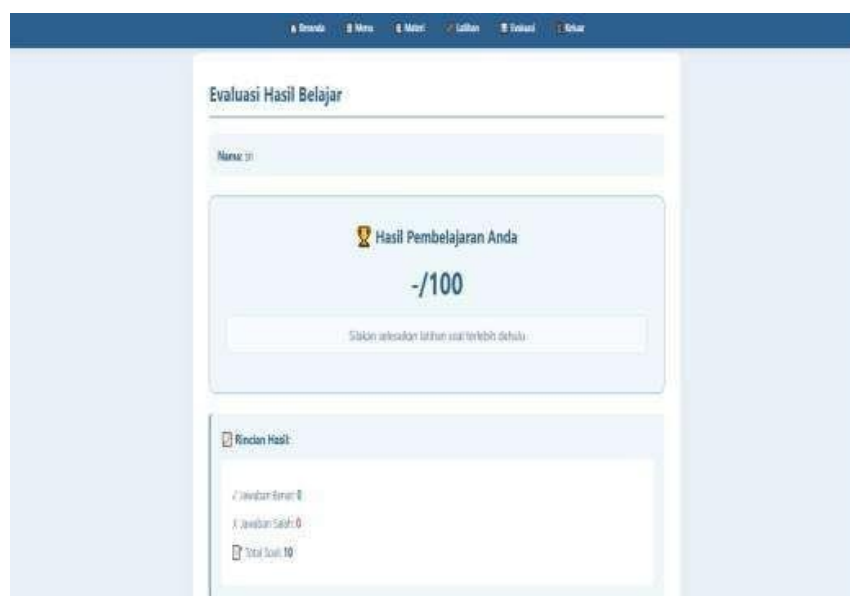


Figure 5. Evaluation Content Display

DISCUSSION

Results of Implementing R&D Methods

- a. First, during the development stage, the designed animated media was successfully adapted to the characteristics of junior high school students and the learning needs of algorithms and programming logic. Validation by material and media experts demonstrated that the developed product met the eligibility criteria, both in terms of content, attractiveness, and ease of use.
- b. Second, the trial results show that animation media is based onScratch can increase students' interest in learning. This is evident in the students' more enthusiastic, active, and focused responses during the learning process. Observations and learning interest questionnaires also show increased student attention, curiosity, and activeness.
- c. Third, the resultspost-test shows a significant increase in value compared to pre-test. Of the 32 students, all experienced an increase in ability, with the percentage increase ranging from 11.11% to 66.67%. Even students with low initial scores experienced the greatest improvement. Thus, the application of the R&D method in this study succeeded in producing a video-based animation product.Scratch which is valid, practical, and effective in increasing students' interest and understanding of Informatics subjects.

Scratch-Based Evaluation Procedures and Processes (Post-test)

The evaluation procedure began after all learning sessions using Scratch animations were completed. Students were directed to take the test in an orderly manner, then given a prepared test sheet. At this stage, the researcher ensured that all students had understood the material presented through the animation, including the algorithmic flow, interactive examples in the animation, and explanations through visual block coding. Next, students answered 20 post-test questions that had a higher level of difficulty than the pre-test, because they focused on the application of concepts. Evaluation data showed that post-test scores increased significantly for all students, with percentage increases ranging from 11.11% to 66.67%, indicating that the use of Scratch in learning had a positive and effective influence on student learning outcomes.

Implementation of Scratch-Based Animation Media in Informatics Learning in Schools

Overall, the implementation of Scratch-based animation applications in schools is carried out through structured stages, namely administering a pretest, presenting material using interactive animation, providing practice questions in the application, observing student responses, and final evaluation through a posttest. The integration of animation media into Informatics subjects not only helps students understand material that was previously considered abstract, but also creates a more active, visual, and enjoyable learning experience, thus aligning with the needs of junior high school students and the objectives of Informatics learning.

Table 1 Tabulation of Pre-test and Post-test Values

No	Student Name	Pretest	Posttest	Ascension (%)
1	Alfindra Munthe	80	100	25.00%
2	Angel Stewany Barnajahor	90	100	11.11%
3	Debora Sihotang	100	100	0.00%
4	Evelyna Ariesta Sianipar	90	100	11.11%
5	Fidela Christabel Parapat	80	100	25.00%
6	Freyl Lumban Toruan	90	100	11.11%
7	Ghessy Ajun Simamullang	90	100	11.11%
8	Isabel Gisela Lumban Tobing	80	100	25.00%
9	Jemima Everet Riske Sihite	90	100	11.11%
10	Johan Axcelo Purba	80	100	25.00%
11	Jois Dinarta Purba	80	100	25.00%
12	Josua Franky Purba	80	100	25.00%
13	Lavin Terry Siringo Ringo	70	100	42.86%
14	Kartika Dewi Purba	90	100	11.11%
15	Kevin Zio Mikael Simarora	70	100	42.86%
16	Lionel Don Bosco Siohombing	80	100	25.00%
17	Longshinta Sr. Enjelina Simamora	80	100	25.00%
18	Mangararan Mananda Samuel Lumban Toruan	80	100	25.00%
19	Mery Natalya Purba	80	100	25.00%
20	Nasrani Angeline Simamullang	90	100	11.11%
21	Noel Yuda Purba	80	100	25.00%
22	Rada Amelia Lubis	90	100	11.11%
23	Rafsan Christian Lubis	90	100	11.11%
24	Reigan Asadoma Situmeang	70	100	42.86%
25	Rotua Margaretha Simamora	80	100	25.00%
26	Samuel Bakri Simanullang	100	100	0.00%
27	Sania Cristina Sinaga	80	100	25.00%
28	Sean Syalomita Manalu	100	100	0.00%
29	Sepiana Fortuna Munthe	90	100	11.11%

30	Stephanie Angelica Jovelina Tobing	80	100	25.00%
31	Vania Natalia Simamullang	90	100	11.11%
32	Yunita Maxilia Sianturi	60	100	66.67%

Based on the calculation of the overall value, it was found that the average pretest, posttest, and percentage increase in students' scores showed a significant increase after using Scratch-based animation learning media.

Category	Mark
Average Pretest	83.75
Average Posttest	100.00
Average Increase (%)	20.86

Thus, the results of this study demonstrate that Scratch-based animated learning media is effective in improving student learning outcomes in Informatics. The implementation of this media makes the learning process more engaging, interactive, and understandable for students, thereby increasing student motivation and active engagement during the learning process.

Table 2 Increase in Pretest and Posttest Presentation Values

Percentage Increase Range	Number of Students	Respondent Example	Information
0% - <10%	3	Debora Sihotang, Samuel Bakri Simanullang, Sean Syalomita Manalu	Students with increases minimal. Generally occurs on students with grades <i>pre-test</i> which are already perfect (100), so no space increase in value.
10% - <20%	11	Angel Stewany Barnajahor, Ghessy Ajun Simamullang, Nasrani Angeline Simamullang, Vania Natalia Simamullang, Sepiana Fortuna Munthe, dsb.	Moderate increase. This increase shows there are improvements that clear but not too big, signifying increased understanding which is good.

20% - <30%	14	Alfindra Munthe, Fidela Christabel Parapat, Josua Franky Purba, Lionel Don Bosco Sihombing, Noel Yuda Purba, Stephanie Angelica Jovelina Tobing, dsb.	Significant improvement. The majority of students in this group obtained the great benefits of media animation based <i>Scratch</i> , shows improvement understanding that substantial.
40% - <50%	3	Lavin Terry Siringo Ringo, Kevin Zio Mikael Simarora, Reigan Asadoma Situmeang	Very high increase. Generally occurs in students with initial grades low (around 70) which then increased drastically to 100 after Learning using animation.
≥60%	1	Yunita Maxilia Sianturi	Extreme improvement. Students with pre-test scores lowest (60) experienced the biggest increase up to 66.67%. This is show positive effects the extraordinary of use of animated media <i>Scratch</i> based.

The table above groups students into several percentage increase ranges based on the pre-test and post-test results. Groups with 0% - <10% group consists of three students who already achieved maximum scores from the start, so there was no numerical improvement. Meanwhile, the 10% - <30% is the largest group with a total of 25 students, which shows a fairly strong increase in understanding after the application of animated learning media. The group with an increase of ≥40% shows very positive results, especially for students with low initial scores. This indicates that the use of *Scratch*-based animated media can help students understand Informatics concepts better, increase learning motivation, and encourage active participation in the learning process.

CONCLUSIONS AND RECOMMENDATIONS

1. *Scratch*-based animations can be designed to meet the needs of Informatics learning at SMP Negeri 1 Dolok Sanggul, by creating attractive, interactive, user-friendly displays that are relevant to the learning materials. The design process included analyzing student and teacher needs, selecting visual designs, developing animation flow, and conducting limited testing. The resulting animations were deemed suitable and effective for use as learning media, helping students understand the material more clearly and increasing their interest in learning Informatics.

2. Implementation of the Research and Development (R&D) method. Each stage was carried out systematically, starting from field needs analysis to limited trials with students. The implementation results showed that the developed animated media was easy to use by teachers and students, and helped create an active and enjoyable learning atmosphere.
3. The use of Scratch-based animation in Informatics learning has a positive effect on increasing students' learning interest. Based on the results of pretest and posttest analysis of 32 students, it was found that the use of Scratch-based animation media not only increased learning interest but also had a positive impact on student learning outcomes. This is evidenced by an average increase in grades of 20.86%, indicating that learning media developed through the Research and Development (R&D) method is effective in helping students better understand Informatics material .

FURTHER STUDY

This study still has limitations, so further research on Scratch-Based Animation Design on Students' Learning Interests is needed to refine this study and enhance the insights of readers and the authors.

REFERENCES

- Aulia, Syarah, Sindi Amelia, and Rahma Qudsi, 'Analisis Minat Belajar Matematika Siswa Dalam Menggunakan Aplikasi Scratch Pada Materi Trigonometri', 4 (2021), 205-14
- Collins, Sean P, Alan Storrow, Dandan Liu, Cathy A Jenkins, Karen F Miller, Christy Kampe, and others, Penggunaan Media Pembelajaran Inovatif untuk meningkatkan minat belajar siswa, 2021, 167-86
- Fiorentina, Ella Viola, Nafiah Nafiah, Muslimin Ibrahim, and M. Thamrin Hidayat, 'Pengembangan Media Pembelajaran Berbasis Scratch Pada Mata Pelajaran Ipa Untuk Meningkatkan Minat Belajar Siswa', Primary Education Journals (JurnalKe-SD-An),5(2025),49-57
<<https://doi.org/10.36636/primed.v5i1.5029>>
- Hasya, Ahmad, Al Hafizh, and Masta Hutajulu, 'Analisis Hasil Belajar Siswa Mts Kelas Vii Melalui Pembelajaran Kontekstual Berbantuan Scratch', Jurnal Padegogik Volume, 6 (2023), 1-18
<<https://doi.org/10.35974/jpd.v6i2.3033>>
- Indahwati, Rohmah, Hasan Basri, and Septi Dariyatul Aini, 'Pengembangan Media Pembelajaran Berbasis Scratch Elemen Bilangan Fase A Pada Kurikulum Merdeka', Kognitif: Jurnal Riset HOTS Pendidikan Matematika, 4 (2024), 1626-37 <https://doi.org/10.51574/kognitif.v4i4.2632>
- Ijonris, Y. (2024). Web-Based Library Information System at Santo Yospeh High School Medan. Journal of Artificial Intelligence and Engineering Applications (JAIEA), 4(1), 567-574.

- Ijontris, Y., Samosir, N., Sitorus, I. S., Simorangkir, T. A., & Hutabarat, A. I. I. (2025, August). Utilization of Augmented Reality (AR) in Learning for Students with Special Needs. In *Proceeding of International Conference on Finance, Economics, Management, Accounting, and Informatics (ICoFEMATICS)* (Vol. 1, No. 1, pp. INF-001)
- Korespondensi, Penulis, 'PENGEMBANGAN MEDIA SCRATCH UNTUK MENINGKATKAN MINAT BELAJAR', 2759 (2024)
- Luthfiyyah, Riska, Juliana Nurhikmah, Najayanti Najayanti, Sani Irsalina, Sarah Nabilah, and Afridha Alindra, 'Pengaruh Media Pembelajaran Berbasis Scratch Terhadap Motivasi Belajar Siswa Kelas IV Di Salah Satu Sekolah Dasar Purwakarta', *INNOVATIVE: Journal Of Social Science Research*, 3 (2023), 5722-31:
- Malang, Universitas Negeri, 'URGENSI PENGEMBANGAN MEDIA PEMBELAJARAN BERBASIS MULTIMEDIA INTERAKTIF SCRATCH SEBAGAI UPAYA MENINGKATKAN MINAT BELAJAR', 2023, 731-38
- Nisa, Andi, Fisca Kirana, Hamzah Pagarra, Bhakti Prima, and Findiga Hermuttaqien, 'Pengaruh Penggunaan Media Pembelajaran Digital Berbasis Aplikasi Scratch Untuk Meningkatkan Minat Belajar Siswa Kelas IV UPT SPF SDN Inpres Cambaya 1 Ujung Tanah Dalam Proses Pembelajaran , Perhatian Terhadap Minat Belajar Merupakan Faktor Penting Dan Al ., 2022
- Pratiwi, Annisa Putri, and Martin Bernard, 'Analisis Minat Belajar Siswa Kelas V Sekolah Dasar Pada Materi Satuan Panjang Dalam Pembelajaran Menggunakan Media Scratch', *Jurnal Pembelajaran Matematika Inovatif*, 4 (2021), 891-98 <<https://doi.org/10.22460/jpmi.v4i4.891-898>>
- Puteri, Suci Nabila, and Oman Farhurrohman, 'Pemanfaatan Media Scratch Untuk Meningkatkan Motivasi Belajar Matematis Siswa Sd', *Js (Jurnal Sekolah)*, 8 (2024), 480 <<https://doi.org/10.24114/js.v8i3.57912>>
- Sarifah, Iva, Akbar Sri Nugroho, Arita Marini, Gusti Yarmi, Desy Safitri, and Leola Dewiyani, 'Scratch-Based Interactive Games to Increase Interest in Learning Mathematics for the Second Grade Elementary School Students', *Jurnal PendidikanDanPengajaran*, 56(2023), 359-69 <<https://doi.org/10.23887/jpp.v56i2.66556>>
- Wibisono, H. A., Rangkuti, A. A., Sukmawati, F., Ijontris, Y., Priyanda, R., Wijaya, L., ... & Iman, A. (2023). *Pengantar Teknologi Pendidikan*. Pradina Pustaka.i2.5305>