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The Effect Of Digital Media Based On Qereatif Educative Hydrowheel On The Science Process Skills Of Grade V State Elementary School 113 Palembang

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Abstract

Students whose process skills are less than optimal will experience obstacles during the learning process, but in class V SDN 113 Palembang, the level of IPAS process skills of students is still low because of the lack of varied media. Therefore, this study aims to find out the influence of digital media based on Creative Educative Hydrowheel on the IPAS process skills of students in class V. This research uses a quantitative approach with the True Experimental Design method in the form of Posttest Only Control Design. The research sample consists of class VB as an experimental class and class VE as a control class. Data collection techniques are carried out through posttest tests and IPAS process skill observation sheets. Data was analyzed through normality test, homogeneity test, and Independent Sample T-Test. The results of the hypothesis test showed a sig value of 0.002, smaller than 0.05. Thus, H0 is rejected and Ha is accepted. This finding shows that digital media based on Qreatif Educative Hydrowheel has a significant effect on the IPAS process skills of students in class V of State Elementary School 113 Palembang.

Keywords: Digital Media, IPAS Learning, Creative Educative Hydrowheel, Science Process Skills

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INTRODUCTION

Science learning in elementary school is not simply understood as simply introducing natural and social concepts verbally. At this level, students need to be guided through a learning process that involves observing, classifying, interpreting data, predicting, communicating results, and drawing conclusions. These skills are crucial because science is directly related to how students interpret the phenomena around them. Ritonga et al. (2020) explain that process skills emphasize the ability to acquire knowledge through scientific activities such as observing, classifying, interpreting, concluding, and communicating results. Santiawati et al. (2022) also emphasize that science process skills relate to students' ability to investigate natural phenomena and construct concepts through active learning experiences.

In the context of science learning, process skills are fundamental so that students not only memorize material but are able to understand the cause-and-effect relationships of an event. For example, learning about the water cycle is not sufficient by memorizing the terms evaporation, condensation, precipitation, and infiltration. Students need to see the relationships between processes, distinguish the characteristics of each stage, analyze the changes that occur, and then construct simple explanations based on the information obtained. Tyas et al. (2020) state that process skill indicators include observing, classifying, interpreting data, predicting, communicating, and drawing conclusions. This means that science learning needs to be designed as an investigative activity, not simply a transfer of information from teacher to student.

Problems that emerged in the fifth grade of SD Negeri 113 Palembang indicate that students' science process skills have not developed optimally. Observations and interviews conducted on October 14 and 16, 2025, in the VB and VE classes showed that students were still passive when observing the water cycle phenomenon through pictures in printed books. In the classification indicator, students still confused the process of seawater evaporation with evaporation in living things. In the data interpretation indicator, students were not yet able to read the cause and effect relationship of the infiltration flow. Difficulties also appeared when students were asked to predict the impact of reduced green areas on groundwater reserves. In fact, in the activity of communicating results and drawing conclusions, some students still relied on teacher explanations and lacked confidence in expressing their own thoughts.

This situation indicates a gap between the objectives of science learning and classroom practice. The main problem lies not only in the low mastery of concepts but also in the limited space for students to directly engage in scientific activities. The still-dominantly conventional learning process results in students receiving more information than exploring phenomena.

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Learning media should, in fact, bridge abstract concepts with concrete learning experiences. Prawesti et al. (2024) explain that learning media can present messages through visual, audio, and audiovisual forms, making the material easier to understand. Jannah and Atmojo (2022) also emphasize that digital media can present material through images, audio, video, and animation, potentially increasing student learning interest.

Digital media is relevant because the characteristics of water cycle material require moving and easily observed visualizations. Through digital media, processes that are difficult to observe directly can be presented in the form of simple, interactive, and repeatable simulations. Milyane et al. (2023) view digital media as a form of content delivery through electronic platforms, while Kuntari (2023) emphasizes that digital platforms provide easy access to information through the internet. Yuniarti et al. (2023) also state that digital media can make learning more varied and interesting, and increase learning motivation. In science learning, this function is important because elementary school students tend to understand material more easily when concepts are presented in a form that is close to visual experiences and concrete activities.

One digital media that can be used in water cycle learning is the Qreatif Educative Hydrowheel. This application was chosen because it contains visual elements, educational games, and interactive activities that can encourage student engagement in learning. Qreatif Educative (2024) explains that this application has multi-platform, interactive, fun, and educational characteristics. Sari et al. (2025) found that the digital media Qreatif.id influenced the mathematics learning outcomes of elementary school students. The findings of Somo and Kiptiyah (2024) also showed that the Qreatif application can improve students' conceptual understanding and learning activities. In addition, Kurniawan and Pamujo (2025) showed that the media assistance of the Qreatif Educative application can support improved achievement in science learning. Several of these findings show that the use of Qreatif media not only functions as a display aid, but can also strengthen student learning activities.

However, this study not only positions digital media as a means to improve learning outcomes, but also as a stimulus to strengthen science process skills. The focus of this study is on how digital media based on Qreatif Educative Hydrowheel can activate the process of observing, classifying, interpreting data, predicting, communicating results, and drawing conclusions. Maisarah and Prasetya (2023) showed that digital media influences science process skills and critical reasoning in elementary school students. Wardhani (2025) also stated that digital-based learning media can improve science process skills in elementary school students. Thus, the use of Qreatif Educative Hydrowheel in this study has a strong conceptual and empirical basis because it

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aligns with the needs of science learning that demands students' scientific activities.

This research focuses on the use of digital media based on Qreatif Educative Hydrowheel in learning science on water cycle material in fifth grade students of SD Negeri 113 Palembang. The research subjects are limited to class VB as the experimental class and class VE as the control class. The formulation of the problem in this research is whether there is an influence of digital media based on Qreatif Educative Hydrowheel on the science process skills of fifth grade students of SD Negeri 113 Palembang. The purpose of this research is to determine the influence of digital media based on Qreatif Educative Hydrowheel on the science process skills of fifth grade students of SD Negeri 113 Palembang .

THEORITICAL REVIEW

INSTRUCTIONAL MEDIA

Learning media is basically a means of conveying information from teachers to students. If the learning environment is well and systematically designed, then learning objectives can be achieved optimally (Saleh dkk., 2023, h. 6). Specifically, the definition of media in the teaching and learning process is often interpreted as a graphic, photographic, or electronic tool used to capture, process, and present information both visually and verbally (Yusup dkk., 2023, h. 211). In the teaching and learning process, media has an important role as an intermediary to convey learning information from teachers to students (Dewi & Handayani, 2021, h. 2531; Wardani dkk., 2024, h. 135). According to AECT (Association of Education and Communication Technology) in (Hartono dkk., 2023, h. 211)providing limitations regarding media as all forms of communication tools and channels used to convey messages or information. Gagne (1979) in (Yusup dkk., 2023, h. 211)also explains that learning media is anything that can be used to convey learning messages. Learning media is a material or tool used by teachers to convey learning materials with the intention that communication interactions between teachers and students can take place interactively to achieve the planned learning objectives (Asari et al., 2023, p. 5).

From the various opinions above, it can be concluded that learning media is a tool or means that helps teachers in delivering lesson material so that the teaching and learning process becomes more effective, efficient, and easier for students to understand.

According to Nasution, (Husna & Supriyadi, 2023; Karomah & Devita, Ramli, 2024, h. 217)the benefits of learning media as a tool that can enrich the learning experience include: 1) Attracting students' attention so as to foster learning inspiration; 2) Clarifying learning materials so that they are easier to understand; 3) Encouraging a shift in strategy from purely verbal

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communication to a variety of methods, so that students do not get bored quickly and teachers are not burdened; 4) Giving more exercises or assignments, not only listening to explanations from the teacher, but also observing, working, making illustrations, and so on.

REAL EDUCATIONAL APPLICATION

The Qreatif Educative application is a platform that offers a variety of applications that make the learning process more interactive, high-quality, and easily accessible through various digital devices (Inafazri & Formen, 2024, h. 842). The Qreatif Educative application is also defined as a digital learning platform that provides various superior features, such as educational games, interactive modules, simulations, and virtual labs. All of these features are designed to create a fun, interactive, and effective learning experience for students (Sari et al., 2025, pp. 310–311) . With interesting features, students can learn independently or collaborate with friends to complete challenges in the game. This method not only strengthens conceptual understanding but also trains students' social skills (Nurhayati dkk., 2024, h. 133).From the opinions above, it can be concluded that the Qreatif Educative application is a digital media or platform designed to provide real experiences for students by offering various educational features such as educational games, simulations and interactive modules.

Based on the official statement on the Qreatif Educative application page, it has three main features, namely Multi Platform, Interactive & Fun, and Educative (Qreatif Educative, 2024) . 1) Multi Platform, shows that this application can be accessed through various devices such as Android and Windows, both mobile and desktop versions, thus providing flexibility for teachers and students in its use; 2) Interactive & Fun, describes that the application is presented in the form of interactive and fun games and simulations to increase student motivation and learning engagement; 3) Educative, emphasizes that this application is specifically designed to help users understand learning materials in an interesting and contextual way.

SCIENCE PROCESS SKILLS

Process skills are an approach in the teaching and learning process that emphasizes the skills of acquiring knowledge through observing, classifying, interpreting data, concluding, and communicating results (Ritonga et al., 2020, p. 294) . Science process skills are a set of scientific work to discover scientific concepts. In learning, science process skills encourage students to conduct investigations by utilizing the surrounding environment (Fauziah, 2022, h 456). Science process skills are defined as the abilities used to investigate natural phenomena and build science

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concepts (Santiawati et al., 2022, p. 223) .

The conclusion from the opinions above is that science process skills are a student's ability to investigate a phenomenon that occurs such as observing, classifying, interpreting data, predicting, concluding and communicating results. The indicators in science process skills according to (Tyas dkk., 2020), are as follows: 1) Observing (Observation): Using some or all of the five senses to obtain information from an object, recognizing differences and similarities between objects and matching the observed objects with the available descriptions; 2) Classifying (Grouping): Determining relevant characteristics for grouping objects, grouping objects and checking the consistency of the data and dividing objects based on visible characteristics, similarities, or differences; 3) Interpreting data: Interpreting data is one of the science process skills that requires students to process, understand, and give meaning to data or information obtained from observations, experiments, or learning media ; 4) Predicting: The ability to estimate an event based on knowledge or observation results that have been obtained; 5) Communicating: Delivering observation results in a structured manner, reading and interpreting information in oral and written form; 6) Drawing conclusions: Drawing conclusions based on observation data, summarizing known facts, concepts, or principles and concluding the results of learning activities that have been carried out.

RESEARCH METHODS

This study uses a quantitative approach with an experimental method. This method was chosen because the study aims to test the effect of digital media based on *Qreatif Educative Hydrowheel* on students' science process skills. The design used is *True Experimental Design* with *a Posttest Only Control Design form* . In this design, the experimental class was given treatment using digital media based on *Qreatif Educative Hydrowheel* , while the control class was given learning using visual media in the form of images.

The research was conducted at SD Negeri 113 Palembang located on Jalan Sosial Simpang Dogan, Sukamaju Village, Sako District, Palembang City, South Sumatra. The research was conducted in the even semester of the 2025 to 2026 academic year. The research population was all fifth grade students of SD Negeri 113 Palembang, which consists of five classes with a total of 175 students. Sampling was carried out using the Simple Random Sampling technique because the population members were considered to have relatively homogeneous characteristics. The results of the lottery determined class VB as the experimental class and class VE as the control class.

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Table 1Research Sample

No.	Class	L	P	Jlh	Note:
1	VB	14	20	34	Experiment
2	VE	14	20	34	Control
	Amount			68	

Source: Homeroom Teacher of Class V, Public Elementary School 113 Palembang

Table 2Research Design

Group	**Treatment**	**Posttest**
Experiment	Learning uses digital media based on *Qreatif Educative Hydrowheel*	O2
Control	Learning using visual media in the form of images	O4

Source: Adapted from *Posttest Only Control Design*

Data collection techniques were carried out through observation, testing, and documentation. Observations were used to assess students' science process skills during the learning process. Aspects observed included observing, classifying, interpreting data, predicting, communicating results, and drawing conclusions. A posttest was administered to measure science process skills after the treatment was completed. Documentation was used as supporting data in the form of activity photos, student names, teaching modules, and posttest scores.

Table 3Data Collection Techniques

No	Technique	Data collected	Note:
1	Observation	Students' science process skills during learning	Referring to the six indicators of IPAS process skills
2	Test	Student posttest scores	Used to compare the experimental class and the control class
3	Documentation	Photos of activities, student lists, teaching modules, and grade results	As supporting data for research

Before being used in the study, the test instrument was tested through validity, reliability, difficulty level, and discrimination tests. This test was carried out to ensure that the questions

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used were suitable for measuring students' science process skills. The research data were analyzed using the *Statistical Package for the Social Sciences* (SPSS) version 22. Data analysis began with a normality test using Shapiro Wilk and a homogeneity test using *Levene's Test of Homogeneity of Variances* . After the data met the requirements, hypothesis testing was carried out using *the Independent Sample T-Test.*

Table 4Data Analysis Techniques

No.	Analysis Stage	Test Type	Objective
1	Pre-requisite test	*Shapiro Wilk*	Knowing whether the *posttest data* is normally distributed
2	Pre-requisite test	*Levene Test of Homogeneity of Variances*	To find out whether the experimental and control class data are homogeneous
3	Hypothesis testing	*Independent Sample T Test*	To determine the influence of digital media based on *Qreatif Educative Hydrowheel* on science process skills

The decision-making criteria in this study are if the sig. value is less than 0.05, then there is a significant difference between the experimental class and the control class. Thus, digital media based on *Qreatif Educative Hydrowheel is stated to have an effect on* process skills.

DISCUSSION

The research results were obtained from *posttest data* and observations of science process skills in the experimental and control classes. The experimental class was a class that received learning using digital media based on *Qreatif Educative Hydrowheel* , while the control class received learning using visual media in the form of images. The research data was not only seen from the final *posttest score* , but also from the development of science process skills activities during three meetings.

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***Table* 5. Summary of SEQ Tabel * ARABIC Posttest Scores for Experimental and Control Classes**

Class	Student Street	Number of Questions	*Post-test* Score	Average	Max Value	Min Value
Experiment	34	10	2700	79.41	100	50
Control	34	10	2340	68.82	100	40

Source: Processed by researchers (2026)

Posttest averages between the experimental and control classes. The experimental class obtained an average of 79.41, while the control class obtained an average of 68.82. The difference between the two classes was 10.59 points. This difference indicates that students who learned using digital media based on *Qreatif Educative Hydrowheel* obtained higher posttest results than students who learned using visual media in the form of images.

These differences in scores do not stand alone as final figures, but are related to the learning experiences students receive. In the experimental class, digital media presented a more vivid visualization of the water cycle and allowed students to observe the process repeatedly. Students not only listened to the teacher's explanation but also saw the relationships between the parts of the water cycle through the app's visualization.

Observation data was used to track the development of science process skills during learning activities. Indicators observed included observing, classifying, interpreting data, predicting, communicating results, and drawing conclusions. A summary of the observation results for the experimental and control classes is presented in the following table.

Table 5Results of Observations on Science Process Skills in the Experimental Class

No.	KPS Indicators	P1	P2	P3	$\bar{x}$	Cat.
1.	Observing	80.9%	89.7%	94.9%	88.5%	Very good
2.	Classifying	71.3%	81.6%	89.7%	80.9%	Good
3.	Interpret	66.2%	77.2%	86.0%	76.5%	Good
4.	Predicting	73.5%	82.4%	89.7%	81.9%	Good
5.	Communicating results	73.5%	86.0%	94.9%	84.8%	Good
6.	Draw a conclusion	64.7%	77.2%	87.5%	76.5%	Good
Overall average		71.7%	82.4%	90.4%	81.5%	Good

Source: Processed by researchers (2026)

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Table 6Results of Observations on Science Process Skills in the Control Class

No.	KPS Indicators	P1	P2	P3	$\bar{x}$	Cat.
1.	Observing	60.3%	66.2%	68.4%	65.0%	Enough
2.	Classifying	57.4%	61.0%	66.9%	61.8%	Enough
3.	Interpret	55.9%	59.6%	65.4%	60.3%	Enough
4.	Predicting	54.4%	57.4%	60.3%	57.4%	Enough
5.	Communicating results	59.6%	64.0%	69.1%	64.2%	Enough
6.	Draw a conclusion	56.6%	59.6%	63.2%	59.8%	Enough
Overall average		57.4%	61.3%	65.6%	61.4%	Enough

Source: Processed by researchers (2026)

Observations showed that the experimental class experienced stronger improvement than the control class. The overall average for the experimental class increased from 71.7% in the first meeting to 82.4% in the second meeting, then reached 90.4% in the third meeting. In the control class, the overall average increased from 57.4% to 61.3%, then to 65.6% in the third meeting. While both classes experienced improvement, the rate of improvement for the experimental class was sharper and fell into the good category, while the control class remained in the fair category.

This difference in development indicates that the *Qreatif Educative Hydrowheel- based digital media* provides a more active learning space for students. The observation indicator was the most prominent aspect in the experimental class, with an average of 88.5% and a very good category. This is logical because digital media allows students to see the water cycle process more clearly than static images. The indicator for communicating results also showed a high achievement, namely 84.8%. This condition shows that the use of media not only helps students understand the concept but also encourages their courage to convey the results of observations and discussions.

For the indicators of interpreting data and drawing conclusions, the experimental class achieved the same average score, 76.5%. Although both were in the good category, these two indicators still needed the most strengthening. This means that digital media has helped students understand the flow of the water cycle, but the ability to interpret cause-and-effect relationships and draw scientific conclusions still requires teacher guidance. In other words, media cannot work alone without structured learning direction. Teachers still need to provide provocative questions, reasoning examples, and practice drawing conclusions so that students are not only interested in the media display but also able to develop scientific understanding.

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In the control class, all indicators were in the sufficient category. The lowest indicator was prediction, with an average of 57.4%. This indicates that the use of visual media in the form of images was not strong enough to help students imagine the possible changes or impacts of a phenomenon. Water cycle material requires an understanding of moving and interconnected processes. When material is presented only in images, students tend to see the water cycle as a sequence of images, rather than as a system with cause-and-effect relationships. This is why the ability to predict and draw conclusions in the control class did not develop as strongly as in the experimental class.

Before hypothesis testing, the posttest data was first tested using normality and homogeneity tests. The normality test was used to ensure that the posttest data in the experimental and control classes were normally distributed. The homogeneity test was used to determine whether the two groups had equal variances. These two tests are important because the study used the parametric Independent Sample T-Test.

Table 7Posttest Normality Test Results

Class	Statistics	df	Sig.	Information
Experiment	0.937	34	0.051	Normal
Control	0.954	34	0.166	Normal

Source: Processed by researchers (2026)

Table 8 shows that the significance value for the experimental class was 0.051 and the significance value for the control class was 0.166. Both values are greater than 0.05, indicating that the posttest data for both the experimental and control classes were normally distributed. Therefore, the data meets one of the requirements for further parametric hypothesis testing.

Table 8Results of the Posttest Homogeneity Test

Levene Statistics	df1	df2	Sig.	Information
0.003	1	66	0.959	Homogeneous

Source: Processed by researchers (2026)

Table 9 shows that the significance value of the homogeneity test is 0.959. This value is greater than 0.05, indicating that the posttest data for the experimental and control classes have the same variance, or are homogeneous. This result confirms the feasibility of using the

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Independent Sample T-Test because the data meets the requirements for normality and homogeneity. After the data was declared normal and homogeneous, hypothesis testing was conducted using *the Independent Sample T-Test* . This test was used to determine whether there was a significant difference between the posttest results of the experimental and control classes after the treatment was administered.

Table 9Results of the Independent Sample T Test

Variance Assumption	F	Sig.	t	df	Sig. (2-*tailed)*	*Mean Difference*	*Standard Error*	*Lower*	*Upper*
Equal variance-ces assum-ed	.003	.959	3,301	66	.002	10,588	3,207	4.185	16,992
Equal variances not assumed	.003	.959	3,301	65,934	.002	10,588	3,207	4.185	16,992

Source: Processed by researchers (2026)

Table 10 shows that the sig. 2-tailed value is 0.002. This value is smaller than 0.05, so H0 is rejected and Ha is accepted. This means that there is a significant difference between the science process skills of students in the experimental class and the control class. The average difference of 10.588 shows that the use of digital media based on *Qreatif Educative Hydrowheel* has a positive influence on the science process skills of fifth-grade students of SD Negeri 113 Palembang.

These results demonstrate that the Qreatif Educative Hydrowheel-based digital media not only serves as a visual aid but also as a means to encourage students to engage in scientific activities. In the experimental class, students found it easier to observe the stages of the water cycle because the processes were presented visually and interactively. The media's visualization enabled students to see the relationship between evaporation, cloud formation, rainfall, and water absorption more concretely. This contrasts with the control class, which only used images, resulting in students receiving more static information.

These findings align with Jannah and Atmojo's (2022) perspective, which states that digital media can present material through images, audio, video, and animation, thereby increasing student learning interest. Kuntari (2023) also explains that digital media facilitates student access and understanding of information through electronic platforms. In this study, this convenience was evident in the improved posttest results and observations of the experimental class. Students

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not only achieved higher scores but also demonstrated improvement in six indicators of science process skills.

The strongest improvement was seen in the observation indicator. This condition indicates that digital media significantly assists students in capturing initial information about water cycle phenomena. When students can clearly observe processes, they have a better foundation for classifying, interpreting data, and predicting the impacts of environmental change. Ritonga et al. (2020) emphasize that process skills are related to students' ability to acquire knowledge through scientific activities. Santiawati et al. (2022) also explain that science process skills require students to investigate phenomena and construct concepts through learning activities. Therefore, the use of digital media in this study is relevant because it supports learning that positions students as active participants.

Furthermore, observations showed that the indicator for communicating results also developed quite strongly in the experimental class. Digital media provided visual stimuli that could be used as discussion material, making it easier for students to re-explain their observations. Previously passive students began to have concrete objects to discuss. This is important because science process skills extend beyond understanding concepts and also encompass the ability to convey ideas coherently. Tyas et al. (2020) stated that communicating results and drawing conclusions are part of the process skill indicators that need to be practiced in science learning.

However, the research also showed that the indicators for interpreting data and drawing conclusions still had lower average scores than those for observing and communicating results. This finding suggests that digital media is not the sole determinant of learning success. While media can clarify material and increase student engagement, the ability to interpret causal relationships still requires teacher guidance. Teachers need to provide prompting questions, guide students in reading data, and coach them in drawing conclusions in their own words. Without such guidance, students potentially simply enjoy the media display without truly understanding the scientific relationships within it.

The results of this study support the findings of Maisarah and Prasetya (2023) who showed that digital media influences the science process skills and critical reasoning abilities of elementary school students. Wardhani (2025) also found that digital-based learning media can improve elementary school students' science process skills. Similar findings were also seen in the study of Sari et al. (2025) who showed the influence of the digital media Qreatif.id on student learning outcomes, as well as the study of Somo and Kiptiyah (2024) who stated that the Qreatif application can improve conceptual understanding and learning activities. This means that the results of this

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study strengthen the evidence that interactive digital media can be a relevant learning strategy for elementary education, especially for materials that require process visualization.

Thus, the influence of digital media based on Qreatif Educative Hydrowheel on science process skills can be explained through three things. First, this media makes the water cycle material more concrete because the abstract process can be observed visually. Second, this media encourages students to be more active because learning is not only centered on teacher explanations. Third, this media provides a learning experience closer to the character of elementary school students who need real examples, attractive displays, and simple activities to understand concepts. Based on the results of the posttest, observation, and hypothesis testing, the use of digital media based on Qreatif Educative Hydrowheel has been proven to have a significant effect on the science process skills of fifth-grade students at SD Negeri 113 Palembang.

CONCLUSION

Based on the research results, digital media based on Qreatif Educative Hydrowheel has a significant effect on the science process skills of fifth grade students of SD Negeri 113 Palembang. This is indicated by the results of the Independent Sample T Test with a sig. value of 0.002 which is smaller than 0.05, so H0 is rejected and Ha is accepted. The experimental class obtained a higher posttest average than the control class, and showed stronger observation development in the indicators of observing, classifying, interpreting data, predicting, communicating results, and drawing conclusions. Thus, the use of digital media based on Qreatif Educative Hydrowheel not only helps students understand the water cycle material, but also encourages student involvement in scientific activities during science learning.

As a follow-up, teachers can utilize interactive digital media as an alternative to science learning, especially in materials that require process visualization. However, the use of media still needs to be accompanied by teacher guidance through trigger questions, discussions, and exercises in drawing conclusions so that students are not only interested in the application's appearance but also able to build scientific understanding independently. Further research can develop the use of Qreatif Educative Hydrowheel media in other science materials or compare it with other digital media to see its effectiveness on broader process skill indicators

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