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THE EFFECT OF USING *ROTI* MEDIA (INTERACTIVE SPINNING WHEEL) ON ENERGY FORM CHANGES MATERIAL TO IMPROVE LEARNING INTEREST OF FOURTH GRADE STUDENTS AT SDIT ABFA PAMEKASAN

Fatimatus Zahrah[1], Mutiatul Hasanah[2]
Universitas Islam Negeri Madura[1,2]
fatimahazzahrah805@iainmadura.ac.id[1], *mutiatulhasanah2706@gmail.com*[2]

Abstrak
Penelitian ini bertujuan untuk menganalisis pengaruh penggunaan media ROTI (Roda Putar Interaktif) terhadap minat belajar siswa kelas IV pada materi perubahan bentuk energi di SDIT ABFA Pamekasan serta mengetahui besaran pengaruhnya. Penelitian ini menggunakan metode kuantitatif dengan desain pre-eksperimental One-Group Pretest–Posttest. Subjek penelitian terdiri atas 36 siswa kelas IV yang seluruhnya dijadikan sampel. Data dikumpulkan melalui angket minat belajar yang telah diuji validitas dan reliabilitasnya. Analisis data menggunakan uji *paired sample t-test* dan regresi linear sederhana. Hasil penelitian menunjukkan adanya peningkatan minat belajar yang signifikan setelah penggunaan media ROTI (Sig. = 0,000) dengan kenaikan rata-rata skor sebesar 4,194. Selain itu, media ROTI memberikan kontribusi sebesar 55,3% terhadap peningkatan minat belajar siswa dengan nilai koefisien korelasi sebesar 0,743 yang menunjukkan hubungan kuat. Temuan ini menunjukkan bahwa media ROTI efektif digunakan sebagai media pembelajaran interaktif untuk meningkatkan minat belajar siswa sekolah dasar.
Kata Kunci: Media ROTI, Minat Belajar, IPAS, Sekolah Dasar

Abstract
This study examines the effect of using ROTI (Interactive Spinning Wheel) media on fourth-grade students' learning interest in energy transformation materials at SDIT ABFA Pamekasan and determines the magnitude of its effect. A quantitative approach with a pre-experimental One-Group Pretest–Posttest design was employed. The participants were 36 fourth-grade students selected through saturated sampling. Data were collected using a validated and reliable learning interest questionnaire. Data analysis was conducted using a paired sample t-test and simple linear regression. The results indicate a statistically significant increase in students' learning interest after the implementation of ROTI media (Sig. = 0.000), with an average score improvement of 4.194 points. Furthermore, ROTI media contributed 55.3% to the improvement of learning interest, with a correlation coefficient of 0.743, indicating a strong relationship. These findings suggest that ROTI media are effective as an interactive learning tool to enhance elementary school students' learning interest.

The Effect of Using ROTI Media (Interactive Spinning Wheel) on Energy Form Change Material to Improve Learning Interest

Keywords*: *ROTI Media, Learning Interest, Science, Elementary School

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Universitas Islam Negeri Madura, Indonesia

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INTRODUCTION

Along with the development of science and technology, teachers are required to continuously innovate in order to improve the quality of learning, particularly at the elementary school level. One strategic effort to support effective learning is the use of instructional media that facilitate the clear and engaging delivery of learning materials (Makki, 2019). Instructional media play an important role in attracting students' attention and supporting their engagement during the learning process. The use of varied and appropriate media can help create a more enjoyable learning atmosphere and reduce students' learning boredom (Sukiman, 2012).

Learning interest is a psychological factor that significantly influences students' involvement in learning activities. Students who have strong learning interest tend to show greater attention, enthusiasm, and active participation during classroom instruction (Hrp, 2022), In practice, students' learning interest at the elementary school level is often not optimal, particularly in learning activities that rely heavily on lecture-based methods. This condition was observed at SDIT ABFA Pamekasan, where students showed low interest in IPAS learning, especially on the topic of changes in energy forms (Susanti, Sani., 2024). Elementary school students are at the concrete operational stage of cognitive development, in which learning is more effective when concepts are presented in tangible and contextual forms. Therefore, instructional media that support direct interaction with learning materials are needed to help students understand abstract concepts more easily (Immanulhaq, 2022). Interactive instructional media are designed to promote active student involvement by enabling learners to respond and engage directly with learning content. Such media allow students to participate more actively in the learning process rather than receiving information passively (Yusnan, 2025).

Previous studies have shown that the use of spinning wheel media can increase students' activeness in science learning. This indicates that game-based instructional media have the potential to improve students' learning engagement in elementary classrooms (Inayah, 2023). Similarly, a study by Syukron Zul Ramdan demonstrates that students' learning interest can be enhanced through the use of spinning wheel media (Ramdan, 2024).

These findings are in line with the results of Ayu Nur Shawni et al., which reveal that attractively designed instructional media can have a positive impact on students' psychological conditions (Shawni, 2023). Despite these findings, research that specifically examines the use of ROTI (Interactive Spinning Wheel) media on the topic of changes in energy forms in IPAS learning to enhance fourth-grade students' learning interest remains limited. This research gap underlines the need for further investigation in this area.

Based on this background, this study aims to examine the effect of using ROTI (Interactive Spinning Wheel) media on fourth-grade students' learning interest in learning energy form changes at SDIT ABFA Pamekasan and to analyze the magnitude of the effect produced. To achieve these objectives, this study employs a quantitative approach using a pre-experimental research design that compares students' learning interest before and after the implementation of ROTI media. The research procedures and data analysis methods are described in the following Method section.

METHOD

This study employed a quantitative approach using a pre-experimental research design. The design applied was the One-Group Pretest–Posttest Design with the scheme O_1 – X – O_2 (Sugiyono, 2016), where O_1 represents the measurement of students' learning interest before the treatment using a questionnaire, X denotes the treatment in the form of instruction on changes in energy forms using ROTI (Interactive Spinning Wheel) media, and O_2 represents the measurement of learning interest after the treatment using the same questionnaire. The research was conducted at SDIT ABFA Pamekasan during the odd semester of the 2023/2024 academic year, with a population consisting of all 36 fourth-grade students. The sampling technique used was saturated sampling, in which all members of the population were included as research samples..

Data collection techniques consisted of three main methods: questionnaires, observation, and documentation. The questionnaire instrument was a closed-ended questionnaire using a 4-point Likert scale (Strongly Agree, Agree, Disagree, Strongly Disagree) measuring four indicators of learning interest, namely attention, active involvement, enjoyment, and engagement, with a total of nine statement items (Slameto, 2015).

Prior to its use, the questionnaire instrument underwent content validity testing through expert judgment by two experts and empirical validity testing using Product Moment correlation, while reliability testing was conducted using Cronbach's Alpha. All tests were performed with the assistance of SPSS version 24. Observation was carried out using a structured observation guide during the learning process to examine the implementation of the media and students' responses, while documentation included photographs of learning activities and administrative documents as supporting data.

Data analysis was conducted to address the research objectives. First, to determine whether there was an effect of using ROTI (Interactive Spinning Wheel) media, a paired sample t-test was employed by comparing students' learning interest scores before (pretest) and after (posttest) the treatment. Second, to examine the magnitude of the effect of using ROTI (Interactive Spinning Wheel) media, simple linear regression analysis was applied by calculating the coefficient of determination (R^2). Prior to conducting the analysis, prerequisite tests were performed, including the normality test using Shapiro–Wilk, the linearity test, and the homoscedasticity test, to ensure the appropriateness of the statistical model used. All data analyses were carried out using SPSS version 24 for Windows with a significance level of $\alpha = 0.05$. Although this study employed a pre-experimental One-Group Pretest–Posttest design, this approach has certain methodological limitations, particularly the absence of a control group. Without a comparison group, the study cannot fully control for external variables that may also influence changes in students' learning interest, such as classroom conditions or individual student characteristics. Therefore, the findings of this study should be interpreted with caution and within the context of the research design applied. Future studies are recommended to employ experimental designs involving control groups to strengthen causal interpretations.

RESULTS AND DISCUSSION

Research Results

This section presents the results of data analysis, starting from assumption testing, the paired sample t-test to address the first research objective, followed by regression assumption testing and simple linear regression analysis to address the second objective. The presentation is based on SPSS data processing results to ensure that the findings are objective and measurable. Before conducting statistical analyses to answer the research objectives, all instruments used were first tested for feasibility. The instruments, which included the questionnaire on the use of ROTI (Interactive Spinning Wheel) media and the learning interest questionnaire, underwent expert validation, empirical validity testing, and reliability testing. Based on the results of expert validation, all instruments obtained average scores within the valid category and were therefore deemed suitable for data collection. The empirical validity test results also indicated that all items in both questionnaires had r-calculated values greater than the r-table value with a significance level of < 0.05. Furthermore, reliability testing yielded Cronbach's Alpha values of 0.884 for the learning interest questionnaire and 0.923 for the media usage questionnaire, both of which are well above the minimum threshold of 0.60. Accordingly, the research instruments were confirmed to be valid, reliable, and consistent for use in subsequent analyses.

1. **Results of the Paired Sample t-Test**

   The paired sample t-test was conducted to determine whether there was a difference

in students' learning interest before and after the use of ROTI (Interactive Spinning Wheel) media. This test was employed to address the first research objective, namely to examine whether the ROTI (Interactive Spinning Wheel) media had a significant effect on improving the learning interest of fourth-grade students.

Prior to conducting the paired sample t-test, several statistical assumptions had to be met to ensure that the test results were valid and reliable. These assumptions included the normality test, which aimed to confirm that the pretest and posttest data were derived from a normally distributed population. The results of the normality test are presented in the following table:

Tabel 1 - Results of the normality test for the t-test

Tests of Normality						
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Pretest_Minat Belajar	.110	36	.200*	.964	36	.287
Posttest_Minat Belajar	.164	36	.016	.961	36	.234
*. This is a lower bound of the true significance.						
a. Lilliefors Significance Correction						

Although the Kolmogorov–Smirnov test for the posttest indicated a significance value below 0.05, the Shapiro–Wilk test, which is more appropriate for this sample size, showed a significance value above 0.05. Therefore, the data were considered to be normally distributed, and parametric testing could be continued.

After the assumptions were met, a paired sample t-test was conducted. The SPSS analysis results indicated a difference in the mean learning interest scores before and after the use of ROTI (Interactive Spinning Wheel) media. The average learning interest score increased from 25.28 in the pretest to 29.47 in the posttest, representing an increase of 4.194 points. The Sig. (2-tailed) value of 0.000 (< 0.05) indicates that this difference is statistically significant. This finding implies that the use of ROTI (Interactive Spinning Wheel) media has a significant effect on improving students' learning interest. Detailed results of the paired sample t-test are presented in the following table:

Tabel 2 - Results of the t-test

Paired Samples Test							
	Paired Differences				T	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std.	95% Confidence			

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				Error Mean	Interval of the Difference				
					Lower	Upper			
Pair 1	Pretest – Posttest	-4.194	5.756	.959	-6.142	-2.247	-4.372	35	.000

2. Results of the Simple Linear Regression Analysis

This test was conducted to address the second research objective, namely to determine the extent to which the use of ROTI (Interactive Spinning Wheel) media contributes to explaining changes in students' learning interest. Prior to conducting the regression analysis, several regression assumptions had to be satisfied, including:

a. **Residual normality test**, to ensure that the residuals (errors) are normally distributed

Tabel 3 - Hasil uji normalitas untuk uji regresi linear sederhana

One-Sample Kolmogorov-Smirnov Test		
		Unstandardized Residual
N		36
Normal Parameters[a,b]	Mean	.0000000
	Std. Deviation	2.71482309
Most Extreme Differences	Absolute	.143
	Positive	.112
	Negative	-.143
Test Statistic		.143
Asymp. Sig. (2-tailed)		.061[c]
a. Test distribution is Normal.		
b. Calculated from data.		
c. Lilliefors Significance Correction.		

b. Homoscedasticity test, to examine whether the data exhibit equal variance across observations.

Tabel 4 - Results of the homoscedasticity test

Coefficients[a]				
Model	Unstandardiz	Standardized	t	Sig.

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		ed Coefficients		Coefficients		
		B	Std. Error	Beta		
1	(Constant)	1.537	1.955		.786	.437
	Penggunaan Media	.002	.065	.005	.029	.977
a. Dependent Variable: residual_positif						

c. **Linearity test**, to ensure that the relationship between variable X (ROTI media) and variable Y (learning interest) forms a linear pattern.

Tabel 5 - Results of the linearity test

ANOVA Table							
			Sum	df	Mea	F	Sig.
Minat Belajar * Pengguna	Between Groups	(Combined)	257.139	11	23.376	5.081	.000
		Linearity	203.154	1	203.154	44.157	.000
		Deviation Linearity	53.985	10	5.399	1.173	.355
	Within Groups		110.417	24	4.601		
	Total		367.556	35			

Based on the SPSS analysis results, all of these assumptions were satisfied; therefore, the regression model was deemed appropriate for further analysis. Subsequently, simple linear regression analysis was conducted.

Tabel 6 - Results of the simple linear regression analysis

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	9.590	3.034		3.161	.003
	Penggunaan	.659	.102	.743	6.482	.000

	Media					
a. Dependent Variable: Minat Belajar						
ANOVA[a]						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	203.154	1	203.154	42.014	.000[b]
	Residual	164.402	34	4.835		
	Total	367.556	35			
a. Dependent Variable: Minat Belajar						
b. Predictors: (Constant), Penggunaan Media						

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.743[a]	.553	.540	2.199
a. Predictors: (Constant), Penggunaan Media				

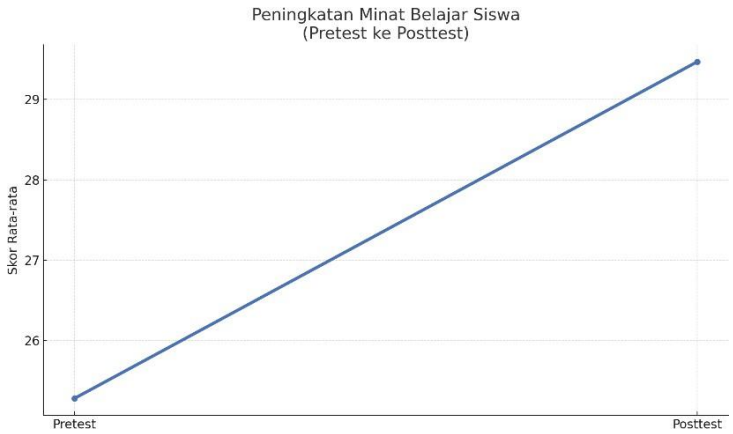
The analysis results indicate that the correlation coefficient value (R = 0.743) reflects a strong relationship between the use of ROTI (Interactive Spinning Wheel) media and students' learning interest. The coefficient of determination (R^2 = 0.553) shows that the use of ROTI (Interactive Spinning Wheel) media contributes 55.3% to the improvement of students' learning interest, while the remaining percentage is influenced by other factors. The significance value of 0.000 (< 0.05) indicates that this relationship is statistically significant. Therefore, it can be concluded that ROTI (Interactive Spinning Wheel) media play an important role in enhancing students' learning interest.

Discussion

The Effect of Using ROTI (Interactive Spinning Wheel) Media on Improving Students' Learning Interest

Based on the results of the paired sample t-test, a significance value of 0.000 (< 0.05) was obtained, indicating a significant difference in learning interest before and after the use of ROTI (Interactive Spinning Wheel) media. The average students' learning interest score increased from 25.28 in the pretest to 29.47 in the posttest, representing an increase of 4.194 points. These findings demonstrate that the use of ROTI (Interactive Spinning Wheel) media

has a positive and significant impact on enhancing students' learning interest. This improvement is clearly illustrated in the following graph:



Picture 1 - Graph of the increase in learning interest from pretest to posttest

Theoretically, this success can be explained through Piaget's cognitive development approach, which posits that elementary school students are in the concrete operational stage (Immanulhaq, 2022). ROTI (Interactive Spinning Wheel) media capitalize on children's natural tendency to learn through direct experience and physical manipulation. Practically, activities such as spinning the wheel, taking turns, and responding spontaneously to questions transformed the abstract learning of energy concepts into an enjoyable and meaningful learning experience. In addition, the visual design of the media, which incorporates bright and contrasting colors, successfully captured students' attention from the beginning of the lesson. This finding is consistent with Arsyad's view that attractive visual media can stimulate curiosity and motivate students to engage actively in the learning process (Arsyad, 2020).

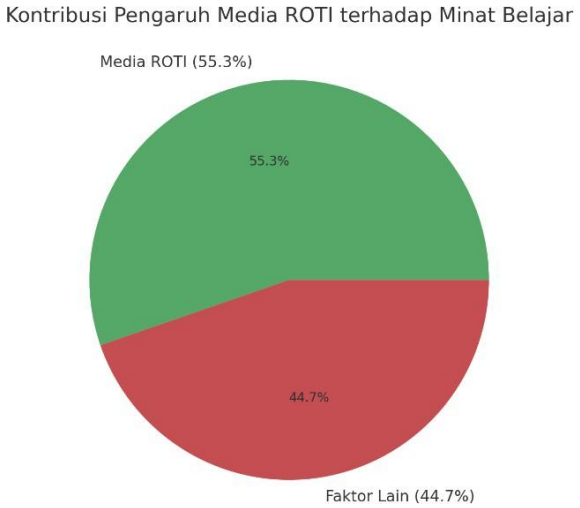
Beyond the statistical improvement, the increase in students' learning interest indicates a meaningful pedagogical shift in the IPAS learning process. The use of ROTI media transformed students from passive recipients of information into active participants who were emotionally and cognitively involved in learning activities. This active engagement allowed students to construct their own understanding through direct experience, which is particularly important in elementary science learning. As a result, learning interest did not merely increase quantitatively, but also qualitatively through greater enthusiasm, attention, and willingness to participate.

This conclusion is further supported by observational findings, which indicate that the use of ROTI (Interactive Spinning Wheel) media stimulated students' emotional engagement. Students appeared more focused, active, and motivated to respond to each question presented. They also provided mutual encouragement when their peers spun the wheel, creating a

classroom atmosphere that was considerably more lively and conducive to learning. This condition aligns with Hamzah Pagarra's assertion that engaging instructional media can activate students' responses, thereby significantly increasing their participation in the learning process (Pagarra, 2022).

The Magnitude of the Effect of Using ROTI Media on Improving Students' Learning Interest.

The results of the simple linear regression analysis indicate that the use of ROTI (Interactive Spinning Wheel) media has a significant effect on students' learning interest, with a significance value of 0.000, a correlation coefficient of R = 0.743, and a coefficient of determination of $R^2 = 0.553$. These findings suggest that ROTI (Interactive Spinning Wheel) media contribute 55.3% to the improvement of students' learning interest. The magnitude of this effect is visualized in the following graph:



Picture 2 - Graph of the magnitude of the effect of bread-based media on learning interest (R^2)

Based on the classification of relationship strength, the R value of 0.743 falls within the strong category, as indicated in the following table (Sugiyono, 2020):

Tabel 7 - Guidelines for interpreting correlation coefficients

Interval Koefisien	Level of relationship
0,00 – 0,199	Very low
0,20 – 0,399	Low
0,40 – 0,599	Moderate
0,60 – 0,799	Strong
0,80 – 1,000	Very strong

The contribution of 55.3% does not occur by chance; rather, it indicates that ROTI (Interactive Spinning Wheel) media operate through strong pedagogical mechanisms. The interactive nature of the media, the game-based elements that stimulate curiosity, its alignment with the cognitive developmental stage of elementary school students, and its ability to create a more dynamic classroom atmosphere collectively contribute to its substantial influence on learning interest. Students are not merely passive observers but are directly involved in spinning the wheel, answering questions, and engaging in discussions. These activities foster positive competition and emotional engagement, which, according to Slameto, are key indicators of the emergence of learning interest (Slameto, 2015).

From a pedagogical perspective, the strong contribution of ROTI media demonstrates that interactive and game-based learning can serve as an effective strategy for enhancing students' learning interest in IPAS. The spinning wheel mechanism encourages anticipation, curiosity, and positive competition, which naturally sustain students' attention during learning activities. This finding suggests that learning interest emerges not only from content mastery, but also from the learning experience itself, where students feel engaged, challenged, and emotionally connected to the lesson.

The observational results further reinforce these findings. Students demonstrated high levels of enthusiasm, sustained focus, and the courage to participate, including those who are typically shy. The media design, which incorporates examples of energy changes from everyday life (such as stoves, radios, and electric fans), also made the material easier to understand and remember.

However, although ROTI (Interactive Spinning Wheel) media contributed 55.3% to the improvement of learning interest, the R^2 value also indicates that the remaining 44.7% of the improvement was influenced by factors beyond the media itself. This suggests that the effectiveness of the media does not stand alone but is shaped by the overall learning conditions. Based on observational findings and theoretical considerations, the enhancement of students' learning interest is also presumed to be influenced by the learning environment, the teacher's teaching style, as well as students' intrinsic motivation and individual conditions.

A conducive classroom environment allows students to clearly view the media, collaborate effectively, and display enthusiasm throughout the learning activities. Seating arrangements organized in groups facilitate more intensive learning interactions, enabling students to easily engage in discussions and support one another in understanding the material. This aligns with observational findings indicating that positive social relationships among students contributed to the creation of a supportive learning environment. Yasintha Pemba et al. also note that positive perceptions of the classroom environment enhance students' emotional and cognitive engagement (Pemba, Yasintha, Damawang, 2022).

Furthermore, a communicative teaching style, clear instructional delivery, and the ability to connect the content of the spinning wheel to concrete examples further strengthened students' curiosity. This was evidenced by observational results showing that the teacher optimally utilized the pointer on the wheel to highlight each type of energy while linking the material to contextual examples. This finding is supported by Ajerin Karim's assertion that an interactional teaching style significantly influences the level of students' active participation in the learning process (Karim, 2024).

In addition, students' initial motivation and physical readiness also influenced their level of engagement. Some students appeared more active, while those who were fatigued or less motivated showed lower levels of responsiveness. Observations indicated that students' physical condition had a tangible effect, and those who naturally showed interest in the IPAS subject demonstrated higher initiative in independent learning. These findings are consistent with Nurlina's theory, which states that internal factors such as physical condition and intrinsic motivation also affect learning interest (Hrp, 2022).

These three factors indicate that the improvement in learning interest results from a combination of the use of ROTI media and supportive learning conditions. Therefore, it is recommended that teachers not rely solely on instructional media, but also create a supportive learning climate, foster students' intrinsic motivation, and cultivate positive social interactions in the classroom to optimize students' learning interest.

In terms of practical implications, the findings of this study highlight the importance of integrating interactive media into IPAS learning at the elementary school level. Teachers are encouraged to move beyond conventional lecture-based instruction and adopt learning media that actively involve students in the learning process. ROTI media can serve as a practical and accessible alternative that does not require advanced technology, yet effectively enhances students' learning interest. When combined with a supportive classroom environment and effective teaching strategies, such interactive media can contribute to more engaging, meaningful, and student-centered IPAS learning.

CONCLUSION

This study concludes that the use of ROTI (Interactive Spinning Wheel) media has a positive and significant effect on improving fourth-grade students' learning interest in the IPAS subject, particularly on the topic of changes in energy forms. The findings indicate that interactive and game-based instructional media can effectively engage students both cognitively and emotionally, resulting in increased enthusiasm, attention, and active participation during the learning process.

From a practical perspective, these findings suggest that IPAS teachers at the elementary school level are encouraged to integrate interactive learning media into classroom instruction. ROTI media can serve as a practical, low-cost, and easy-to-implement alternative for creating

a more engaging and student-centered learning environment. Schools may also support teachers by facilitating the development and use of simple interactive media that align with students' developmental characteristics and learning objectives, thereby fostering students' learning interest more sustainably.

For future research, it is recommended that studies employ stronger experimental designs, such as quasi-experimental or true experimental designs with control groups, to better control external variables and strengthen causal inferences. In addition, future studies may explore other relevant variables beyond learning interest, such as learning motivation, conceptual understanding, critical thinking skills, or learning outcomes, as well as examine the long-term effects of interactive media use in IPAS learning.

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