



## The Influence of Learning Models *Windows Shopping* to Critical Thinking Skills of Students in the Science Subject of Grade IV at SDN 2 Marga Agung

Lita Saputri <sup>1\*</sup>, Baharudin <sup>2</sup>, Muhammad Muchsin Afriyadi <sup>3</sup>

<sup>1,2,3</sup>Universitas Islam Negeri Raden Intan Lampung

Correspondence E-mail: [litasptri12@gmail.com](mailto:litasptri12@gmail.com)

ABSTRACT	ARTICLE INFO
<p><i>Critical thinking skills among elementary school students remain relatively low, as indicated by the dominance of conventional teacher-centered learning and limited student engagement in the learning process. This study aims to analyze the effect of the Windows Shopping learning model on the critical thinking skills of fourth-grade students in science (IPAS). The study employed a quantitative approach using a quasi-experimental design with a Nonequivalent Control Group Design. The sample consisted of two groups: an experimental class treated with the Windows Shopping model and a control class receiving conventional instruction. Data were collected through pretest and posttest, observation, and documentation, and analyzed using normality, homogeneity, and independent sample t-test. The results showed a significant difference between the two groups, with a significance value of 0.000 (&lt; 0.05), and a higher mean improvement in the experimental group. In conclusion, the Windows Shopping learning model is effective in improving students' critical thinking skills. The implications of this study highlight the importance of implementing interactive and activity-based learning models to foster critical thinking skills in elementary education.</i></p> <p>© 2026 Kantor Jurnal dan Publikasi UPI</p>	<p><b>Article History:</b> Submitted/Received 09 Mar 2026 First Revised 01 Apr 2026 Accepted 14 Mei 2026 First Available online 22 May 2026 Publication Date 01 Jun 2026</p> <hr/> <p><b>Keywords:</b> Learning Models; Windows Shopping; Critical Thinking Skills.</p>

## 1. INTRODUCTION

Critical thinking skills are a concern in various countries, including Indonesia, especially at the elementary school level (Atris Yuliarti Mulyani, 2022; Pertiwi et al., 2024; Adwitya Widya Dhari & Ira Maisarah, 2025). This is reflected in the results of the Program for International Student Assessment (PISA) international survey in the field of science which shows that Indonesia's achievements are still relatively low. Based on PISA 2022 data, Indonesia's science ability score in 2022 was 383, below several countries in the Southeast Asian region such as Singapore (561), Vietnam (472), and Malaysia (416). In addition, Indonesia's achievements in the 2006-2022 period showed a tendency to stagnate and fluctuate, namely from a score of 393 in 2006, decreasing to 383 in 2009 and 2012, increasing in 2015 to 403, then decreasing again in 2018 (396) and 2022 (383). In the PISA science assessment, critical thinking is not only seen from students' ability to remember scientific concepts, but also from their ability to use scientific knowledge to solve problems, interpret data, evaluate evidence, and draw conclusions based on valid information. PISA measures these abilities through scientific literacy tasks that require students to explain scientific phenomena, evaluate scientific investigations, and interpret data and evidence in various real-life contexts. Therefore, low achievement in PISA science indicates that students still experience difficulties in reasoning, analyzing information, evaluating the validity of evidence, and making decisions based on scientific arguments.

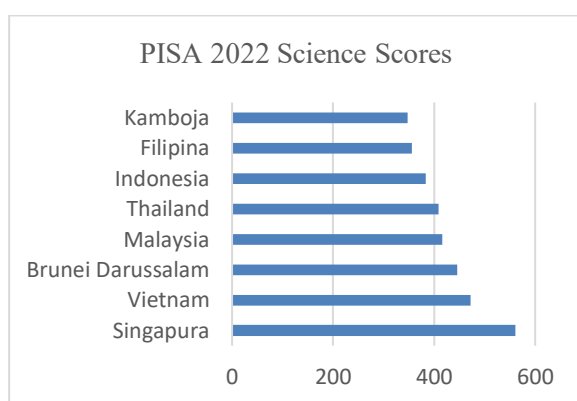


Figure 1. PISA Scores of ASEAN Countries (Science Sector)

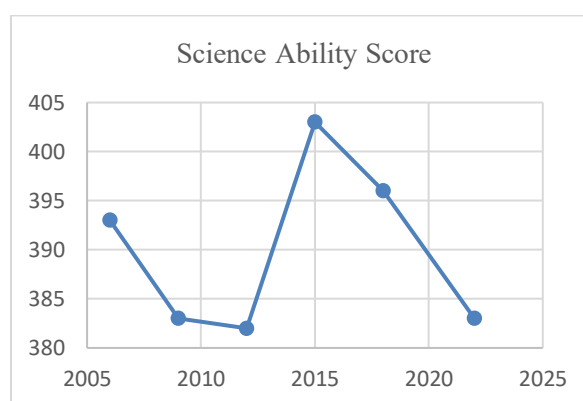


Figure 2. Indonesia's PISA Science Proficiency Scores 2006-2022

This condition shows that high-level thinking skills, including critical thinking, of Indonesian students have not yet developed optimally (Hewi & Shaleh, 2020; Abdullah & Munawwaroh, 2024). The measurement of critical thinking through PISA is important for Indonesian education because it reflects students' readiness to face complex problems in daily life, not merely their ability to master subject content. In the context of elementary education, critical thinking needs to be developed early so that students are trained to ask relevant questions, examine information carefully, provide logical reasons, and make conclusions responsibly. These skills are also in line with the demands of 21st-century learning and the Independent Curriculum, which emphasizes active learning, problem solving, collaboration, and meaningful understanding. On the other hand, learning practices in elementary schools still tend to emphasize achieving correct answers rather than encouraging students to put forward new ideas, provide reasons, and reflect on the conclusions obtained (Astuti et al., 2022). Therefore, efforts are needed by teachers to design and implement learning that is able to develop students' critical thinking skills.

Educators need a deep understanding of effective learning models to enhance critical thinking skills. However, the reality on the ground is that conventional teacher - *centered learning models* result in students becoming more accustomed to passively receiving information rather than constructing their own understanding. (Astuti et al., 2022; Siti Rofi'ah, 2024). The low critical thinking skills of students in elementary schools are caused by several factors. Lack of social interaction of students can affect their critical thinking skills (Prameswari, 2018; Ekti Karimah, 2024). In addition, factors that cause low critical thinking skills of students in elementary schools are learning approaches that are still dominated by lecture and memorization methods (Suhardi et al., Wangsa et al., 2021; Yusnita et al., 2022; Ramadhani & Aufa, 2024; Ramadhani & Aufa, 2024). Thus, the existence of a learning approach that involves student activity is expected to improve critical thinking skills in the learning process.

Based on the results of initial observations conducted by researchers in grade IV of SD Negeri 2 Marga Agung, it was found that the implementation of science learning was still dominated by one-way material delivery, resulting in low student engagement in the learning process. During the learning activities, most participants tended to think passively, rarely asked questions, and were not yet accustomed to expressing opinions or providing logical reasons for their answers. When given questions that required simple reasoning or analysis, students mostly waited for direction from the teacher or imitated the answers of their peers. In addition, the implementation of group discussions was not running optimally, as indicated by minimal interaction between students and a tendency for learning to focus more on completing tasks than on developing in-depth thinking processes. These findings indicate that students' critical thinking skills have not yet developed optimally, especially in indicators of building basic skills and organizing strategies and tactics, such as the ability to consider the validity of information, observe and broadcast observation results, and determine appropriate problem-solving steps. Therefore, it is necessary to implement a learning model that can systematically encourage student activity, interaction, and reflection, one of which is through the application of the *Windows Shopping* learning model in science learning.

Several previous studies have shown that using innovative learning models as a learning approach can improve students' critical thinking skills. For example, the *Problem-Based Learning* (PBL) model has been shown to be effective in training students in critical thinking by encouraging them to analyze and find solutions to real-life problems (Zubaidah, 2022; ). The Muslimah & Agustina Tyas Asri Hardini, 2023) *discovery learning* model has also been shown to encourage students to build understanding through active exploration and reflection in problem-solving (Sayangan et al., 2024). Another learning model that has the potential to improve critical thinking skills is *Windows Shopping*. (Ahyar Rasidi, 2019) This model prioritizes exploration and active interaction among students in understanding the material through discussion, information sharing, and evaluation of the concepts learned.

Although many studies have examined innovative learning models in improving students' critical thinking skills, there are still significant research limitations related to the influence of the *Windows Shopping model* specifically on students' critical thinking skills in science learning at the elementary school level. Most studies discussing this model focus more on improving learning outcomes (Choirunnisa et al., 2024; Henri Mustofa, Heri Maria Zulfiati, 2024), learning outcomes (Nengsih, 2022; Ngatiyem, 2023), and learning interests (Santika, 2024), while studies focusing on the influence on critical thinking have not been widely studied. In addition, several existing studies focus more on higher levels of education, such as university students (Ahyar Rasidi, 2019b), junior high school (Choirunnisa et al., 2024; Hafiza Nafi'ah, 2024; Henri Mustofa, Heri Maria Zulfiati, 2024; Nengsih, 2022; Ngatiyem, 2023) or high school (Santika, 2024), so that

research at the elementary school level, especially in grade IV, is still limited. Therefore, further research is needed to determine the extent to which the *Windows Shopping learning model* can be an effective alternative in improving students' critical thinking skills.

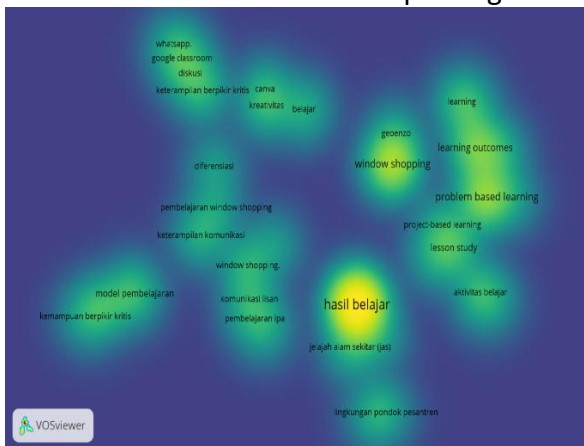


Figure 3. Density Visualization

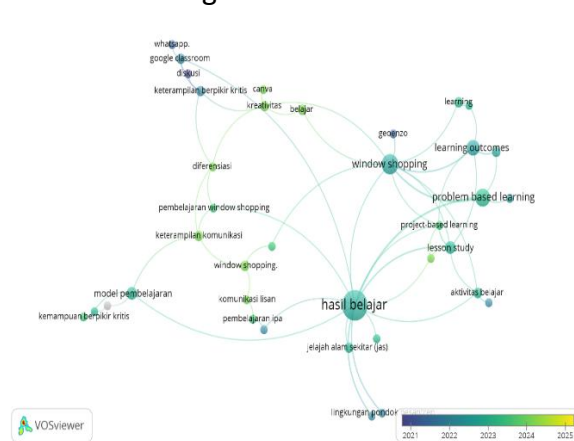


Figure 4. Overlay Visualization

Based on results analysis bibliometrics use VOSviewer through visualization density and overlay visualization, visible that Windows Shopping topic has strong connection with results learning outcome, which is indicated by the intensity the brightest light, so show that part big study previously more focus on the influence of learning models to results Study cognitive. In addition, the approach learning based problems and results learning also shows intensity light high, indicating domination studies on learning models that focus on improvement understanding participant educate. On the other hand, the topic ability think critical and learning models only own intensity light moderate, which indicates that connection between the Windows Shopping learning model and ability think critical has investigated However Still relatively limited and not yet become focus main research. More further, context learning in the eyes science lessons at the level school basic, especially class IV, not yet looks dominant in map bibliometrics, while element supporters based technology such as WhatsApp, Google Classroom, and Canva appeared with intensity light low, which indicates that integration strategy aspects learning as well as strengthening the thinking process critical through activity reflective Not yet Lots explored.

Findings This show existence gap research (research gap) in the form of limitations study empirically which specific analyze the influence of the Windows Shopping learning model on ability think critical participant educate school base in context science learning, with focus on the thinking process critical as objective main learning, not just results learning. Therefore, the novelty of this research lies in the study that specifically proves the effectiveness of the Windows Shopping learning model in improving the critical thinking skills of fourth grade students in the science subject, accompanied by an emphasis on discussion and reflection activities as a reinforcement of the critical thinking process, and produces practical recommendations for elementary school teachers in implementing learning models that are appropriate to the characteristics of students and intensive in development.

The urgency of this research lies in the need to develop a learning model that not only improves learning outcomes but also effectively trains students' critical thinking skills from an early age, particularly in the subject of science at the elementary school level. Considering that the Windows Shopping model has been studied more in relation to learning outcomes than critical thinking, this research plays an important role in filling this gap by exploring how this model can be optimized to improve the critical thinking skills of fourth-grade students. In addition, by integrating reflective discussion strategies, this research contributes to building

basic skills with sub-indicators considering the validity of information and observing and considering reports of observation results, making it more relevant to the demands of 21st-century skills. Based on this urgency, this study aims to analyze the effect of the Windows Shopping learning model on the critical thinking skills of fourth-grade students in the subject of science, as well as to develop practical recommendations for educators in implementing this model effectively according to the characteristics of elementary school students.

## 2. RESEARCH METHODOLOGY

The approach used in this research is quantitative. Quantitative research aims to examine a problem by collecting and analyzing data numerically using statistical procedures (Patonah et al., 2023). This study uses a quasi-experimental design method with a Nonequivalent Control Group Design that compares two groups, namely the experimental group given treatment with the Windows Shopping learning model and the control group using conventional learning. This study aims to determine the effect of the Windows Shopping learning model on the critical thinking skills of fourth-grade students of SDN 2 Marga Agung in the subject of science. The unit of analysis in this study is the critical thinking skills of students, which are focused on two indicators from Robert Ennis's theory, (Ennis, 2011) namely focusing on questions and observing and considering observation reports. To clarify the stages of conducting the research systematically, the following is a flow of research procedures that describe the steps of the research from the beginning to drawing conclusions.

The research procedure consisted of preparation, implementation, and final stages. In the preparation stage, the researcher conducted preliminary observations, determined the experimental and control classes, prepared lesson plans, developed learning materials, and arranged pretest, posttest, observation, and documentation instruments. In the implementation stage, both classes were given a pretest to measure students' initial critical thinking skills. The experimental class was then taught using the Windows Shopping learning model, while the control class used conventional learning. After the treatment, both classes were given a posttest to determine the improvement of students' critical thinking skills.

The Windows Shopping model in the experimental class was implemented by dividing students into small groups. Each group discussed a science problem or subtopic, prepared the results of the discussion, and displayed them as a "window" in the classroom. During the activity, some students acted as presenters who explained their group work, while other students visited different groups to observe, ask questions, compare information, and record important findings. After the rotation, students returned to their original groups to discuss the information obtained, improve their answers, and draw conclusions. These activities trained students to focus on questions, consider observation results, evaluate information, and express logical reasons.

The teacher acted as a facilitator during the learning process. The teacher explained the learning objectives, organized groups, guided discussions, provided stimulus questions, monitored students' activities during the rotation, clarified misconceptions, and guided students in reflecting on the learning outcomes. In the control class, learning was carried out conventionally through teacher explanation, question and answer activities, and assignment completion.

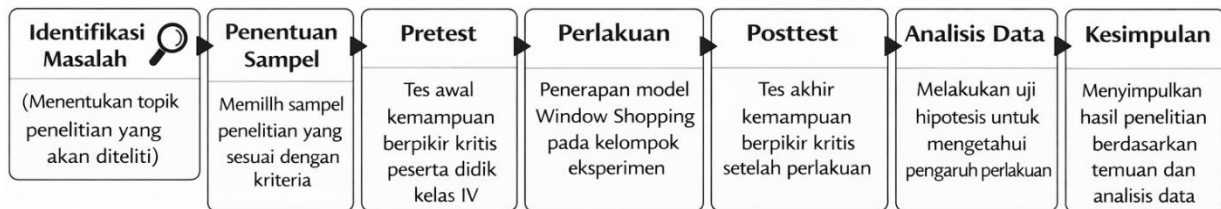


Figure 5. Procedure Flow Study

Participants in study This is participant educate selected class IV of SDN 2 Marga Agung use technique *purposive sampling*. Selection sample based on criteria that participant educate has follow science learning in general full, have level think relative critical homogeneous based on results test exam summative end of semester, and be in the environment schools that have apply Independent curriculum. The sample consisted of two classes, one acting as the experimental group and the other as the control group. Twenty-eight students were in the control class with a conventional learning model, and 22 students were in the experimental class with a *Windows Shopping learning model*.

The data collection process was carried out using *pretest* and *posttest tests*, observation, and documentation. *The pretest* and *posttest tests* consisted of 10 multiple-choice questions and 5 essay questions. These tests were given before and after the implementation of the learning model to measure the improvement of students' critical thinking skills. Observations were conducted during the learning process to see students' active involvement in developing their critical thinking skills, while documentation was used to collect supporting data such as learning activities and student work results. Data analysis in this study began with validity and reliability tests to ensure the test instrument was suitable for use. Next, discriminant power and difficulty levels were tested to assess the quality of the test items. After the instrument was declared valid and reliable, the data were analyzed using the Shapiro-Wilk normality test and Levene's homogeneity test to ensure the data were normally distributed and had homogeneous variance. To provide a more systematic overview of the stages of data analysis, the following is a presentation of the statistical data analysis model used in this study.

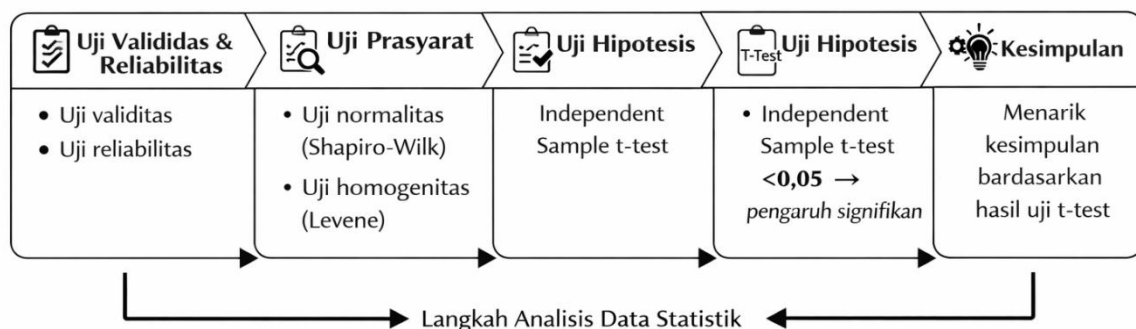


Figure 6. Statistical Data Analysis Model

Hypothesis testing was conducted using an *Independent Sample t-test* to compare the *pretest* and *posttest results* between the experimental and control groups. If the significance value is  $<0.05$ , the *Windows Shopping learning model* is declared to have a significant effect on improving students' critical thinking skills.

With this method, it is hoped that the research can provide a clear, systematic, and empirical picture regarding the effectiveness of the *Windows Shopping learning model* in

improving students' critical thinking skills.

### 3. RESULTS AND DISCUSSION

#### 3.1. Statistics Descriptive

Descriptive statistical analysis was conducted to provide an initial overview of the characteristics of the critical thinking skills of students in the experimental and control classes, both before and after the treatment. The statistics presented include the number of samples (N), minimum, maximum, and average values (*mean*), and standard deviation as an indicator of data distribution.

Table 1. Descriptive Statistics of Students' Critical Thinking Skills

Class	N	Minimum	Maximum	Mean	Standard Deviation
Experiment Pretest	25	40	95	71.40	15,647
Experiment Posttest	25	65	100	85.00	10,801
Pretest Control	25	25	100	58.80	20,831
Posttest Control	25	50	80	67.60	9,256

Based on Table 1, it can be seen that the critical thinking skills of students in the experimental class experienced a significant increase after being given the treatment. The average score increased from 71.40 in the pretest stage to 85.00 in the posttest stage. In addition, there was a decrease in the standard deviation value from 15.647 to 10.801, which indicates that the variation in student abilities became more homogeneous after the implementation of the learning model. In the control class, an increase in the average score also occurred, namely from 58.80 to 67.60. However, this increase was relatively lower compared to the experimental class. This indicates that although conventional learning still contributes to improving learning outcomes, its effectiveness is not as optimal as the learning model applied in the experimental class. In general, these descriptive findings provide an initial indication that the Windows Shopping learning model has the potential to have a greater influence on improving students' critical thinking skills.

#### 3.2. Normality Test

Normality test aim For test is the research data normally distributed as one of the prerequisite in use of statistical tests parametric. In this study, the normality test was conducted using the Shapiro–Wilk method, considering that the number of samples in each group was less than 50 respondents.

Table 2. Results of Normality Test (Shapiro–Wilk)

Class	Statistics	df	Sig.
Pretest Control	0.942	25	0.168
Posttest Control	0.932	25	0.097
Experiment Pretest	0.937	25	0.125
Experiment Posttest	0.926	25	0.070

Based on the results of the normality test in Table 2, all significance values (Sig.) are greater than 0.05. Therefore, it can be concluded that the data in both groups, both pretest and posttest, are normally distributed. Meeting this normality assumption allows for the use of parametric statistical analysis in subsequent stages, particularly in hypothesis testing.

### 3.3. Homogeneity Test

A homogeneity test is conducted to determine whether the data variance between the experimental and control groups is homogeneous. This test uses Levene's Test as the basis for decision-making.

Table 3. Results of the Homogeneity Test (Levene's Test)

Criteria	Levene Statistics	df1	df2	Sig.
Based on Mean	0.185	1	48	0.669
Based on Median	0.214	1	48	0.646
Based on Median (Adjusted df )	0.214	1	46,856	0.646
Based on Trimmed Mean	0.223	1	48	0.639

Based on Table 3, the significance value for the Based on Mean criterion is 0.669, which is greater than 0.05. This indicates that the data variance between the two groups is homogeneous. Thus, the homogeneity assumption has been met, allowing the analysis to proceed using an independent sample t-test with the assumption of equal variances assumed.

### 3.4. Hypothesis Testing (Independent Sample t-test)

Hypothesis testing was conducted to determine whether there was a significant difference between the critical thinking abilities of students in the experimental class and the control class after the treatment was given.

Table 4. Results of the Independent Sample t-test

Criteria	t	df	Sig. (2-tailed)	Mean Difference	Standard Error Difference	Lower	Upper
Equal variances assumed	-6,116	48	0,000	-17,400	2,845	-23,120	11,680

Based on the analysis results in Table 4, a significance value (Sig. 2-tailed) of 0.000 was obtained, which is smaller than 0.05. This indicates that the null hypothesis ( $H_0$ ) is rejected and the alternative hypothesis ( $H_1$ ) is accepted. Thus, it can be concluded that there is a significant average difference between the experimental class and the control class. The mean difference value of -17.400 indicates that the increase in critical thinking skills in the experimental class is higher than in the control class. In addition, the range of the confidence interval that does not include the zero value further strengthens that the difference is statistically significant.

### 3.5. Discussion

Research result show that the application of the Windows Shopping learning model provides significant influence to improvement ability think critical participant educate class IV in the eye science lessons . Findings This supported by the results of the independent sample t-test which shows mark significance of 0.000 ( $< 0.05$ ), so hypothesis alternative ( $H_1$ ) is accepted . This means that there is meaningful differences between ability think critical participant students who follow learning with the Windows Shopping model and participants students who

follow learning conventional . Descriptively, the increase in critical thinking skills in the experimental class appeared higher compared to the control class. The average posttest score of the experimental class reached 85.00, a substantial increase from the average pretest score of 71.40. In contrast, the control class only experienced an increase in the average score from 58.80 to 67.60. This difference in improvement indicates that conventional learning is still able to improve learning outcomes, but is not optimal in developing critical thinking skills in depth compared to the Windows Shopping model. The descriptive data also show that the standard deviation in the experimental class decreased from 15.647 in the pretest to 10.801 in the posttest. This decrease indicates that students' critical thinking skills became more evenly distributed after the treatment. In other words, the Windows Shopping model did not only improve the average score, but also helped reduce the gap in students' abilities. This condition suggests that students with different initial abilities were able to participate in learning activities and gain benefits from discussion, observation, and peer explanation.

The significant increase in the experimental class can be interpreted as the result of several learning factors. First, the Windows Shopping model provides wider opportunities for students to actively seek, compare, and evaluate information. This activity trains students to focus on questions and examine the relevance of information before drawing conclusions. Second, group discussion enables students to exchange ideas and clarify their understanding through peer interaction. Third, the activity of visiting other groups' work encourages students to observe, ask questions, and assess the accuracy of information presented by their peers. These activities directly support the development of critical thinking because students are required to give reasons, compare arguments, and make decisions based on evidence.

The improvement in critical thinking skills in the experimental class can be explained through the main characteristics of the Windows Shopping model, which emphasizes discussion activities, information exchange, and evaluation of ideas between groups. In this process, students do not merely passively receive information, but are required to focus on questions, observe and consider observation reports, and evaluate the validity of information obtained from other groups. These activities align with Ennis's indicators of critical thinking skills, particularly in the aspects of building basic skills and organizing strategies and tactics. Furthermore, active student involvement during the learning process also contributes to the improvement of critical thinking skills. The process of moving from one "window" to another encourages students to compare various perspectives, filter relevant information, and formulate rational conclusions. Thus, learning becomes more meaningful because students are directly involved in the process of knowledge construction.

The effectiveness of the Windows Shopping model can also be understood through constructivist learning theory. Constructivism views learning as an active process in which students construct knowledge through direct experience, interaction, and reflection. In the Windows Shopping model, students do not receive concepts only from the teacher. They build understanding through group work, gallery observation, peer questioning, and reflection on the information obtained. This learning process helps students connect prior knowledge with new information, so their understanding becomes stronger and more meaningful.

In addition, the Windows Shopping model is relevant to Vygotsky's social constructivist theory, which emphasizes the role of social interaction in cognitive development. Through group discussion and peer explanation, students receive support from friends who may have different levels of understanding. This process allows students to learn within their zone of proximal development. Students who initially have difficulty can understand the material through explanation, examples, and questions from peers. Therefore, the interaction built in

Windows Shopping becomes an important factor that supports the improvement of students' critical thinking skills.

The results of this study align with the findings of [Ahyar Rasidi \(2019\)](#) who stated that the Windows Shopping learning model has a positive effect on critical thinking skills, even though the research context was conducted at a higher education level. These similar results indicate that conceptually, Windows Shopping is a learning model that consistently facilitates the development of higher-order thinking skills, including critical thinking, at various levels of education. Furthermore, the findings of this study also support the results of research examining other innovative learning models, such as Problem-Based Learning and Discovery Learning, which have been proven effective in improving students' critical thinking skills ([Zubaidah, 2022](#); [Muslimah et al., 2023](#); [Sayangan et al., 2024](#)). The main similarities between these models and Windows Shopping lie in the emphasis on student-centered learning activities, active discussions, and collaborative problem-solving. This means that critical thinking skills can develop better when students are placed as active learners who investigate problems, process information, and communicate ideas. The Windows Shopping model supports these conditions because students are trained to identify problems, observe the work of other groups, provide responses, and revise their understanding based on new information.

However, this study offers a distinct contribution from most previous studies, which have focused primarily on the influence of Windows Shopping on cognitive learning outcomes, learning activities, or learning interests ([Nengsih, 2022](#); [Ngatiyem, 2023](#); [Santika, 2024](#)). This study focuses specifically on critical thinking skills as the primary learning objective, particularly in science subjects at the elementary school level. Therefore, the results of this study reinforce bibliometric findings indicating that studies on the relationship between the Windows Shopping model and critical thinking skills are still relatively limited and require empirical reinforcement.

In the context of science learning in elementary schools, the Windows Shopping model is effective because science requires students to observe phenomena, ask questions, analyze information, and make conclusions based on evidence. These processes are closely related to critical thinking. When students observe the results of group work displayed in the classroom, they practice identifying important information and comparing it with their own group's findings. When students ask questions or respond to other groups, they practice giving reasons and evaluating explanations. Therefore, the Windows Shopping model is not only useful for increasing classroom activity, but also relevant for strengthening scientific thinking in science learning.

The findings of this study have significant theoretical and practical implications. Theoretically, the results of this study strengthen the foundation that critical thinking skills can be developed effectively through a cooperative learning model that emphasizes social interaction, discussion, and reflection. The Windows Shopping model has proven to be an alternative learning strategy relevant to the demands of developing 21st-century skills, particularly critical thinking, collaboration, and communication skills. Practically, the results of this study provide implications for elementary school teachers, particularly in science learning. Teachers are advised to implement the Windows Shopping model as a learning variation to reduce the dominance of the lecture method and increase student activeness. By designing challenging tasks, reflective prompting questions, and managing structured group discussions, teachers can optimize the potential of this model to train students in focusing questions, evaluating information, and drawing logical conclusions.

The implication for science learning practice in elementary schools is that teachers need to design learning activities that provide space for students to investigate, discuss, and present

their ideas. The teacher should not only explain concepts, but also facilitate students in finding information, asking critical questions, and evaluating the results of group work. In implementing Windows Shopping, teachers need to prepare clear problem-based tasks, organize group roles, provide observation sheets, and guide students to write conclusions based on evidence. This strategy can help students develop critical thinking gradually through concrete and collaborative learning activities.

These findings also imply that science learning should be directed toward active and reflective learning. Teachers can use Windows Shopping to teach topics that require observation, classification, comparison, and explanation. For example, in science topics related to changes in the form of objects, ecosystems, energy, or the human body, students can work in groups to analyze information, display their findings, visit other groups' work, and provide feedback. This activity helps students understand science concepts while practicing critical thinking skills.

Furthermore, for policymakers and curriculum developers, the results of this study can serve as a basis for consideration in encouraging the use of innovative learning models that are oriented not only toward achieving learning outcomes but also toward strengthening critical thinking processes from the elementary level. This aligns with the implementation of the Independent Curriculum, which emphasizes meaningful learning and holistic student competency development.

Although this study shows significant results, there are several limitations that need to be considered. First, this study used a quasi-experimental design with a relatively limited sample size and only involved one school, so generalizing the research results to a broader context requires caution. Second, the critical thinking skills indicators analyzed in this study were limited to two indicators based on Ennis's theory: focusing questions and observing and considering observation reports. Therefore, critical thinking skills were not fully accommodated comprehensively. Third, the duration of the Windows Shopping model implementation in this study was relatively short, so it cannot yet describe the long-term impact on the development of students' critical thinking skills. Furthermore, external factors such as differences in student characteristics, teacher readiness in implementing the learning model, and the condition of the learning environment also have the potential to influence the research results.

Based on these limitations, further research is recommended to involve a wider sample, examine more diverse critical thinking indicators, and combine quantitative and qualitative approaches to obtain a more in-depth picture of the process of developing critical thinking skills through the Windows Shopping learning model.

#### **4. CONCLUSION**

Based on results research, it can be concluded that the Windows Shopping learning model has an effect significant to improvement ability think critical participant educate class IV in the eye Science lessons. This is indicated by a significant difference in the average score between the experimental and control classes, with a significance value of 0.000 ( $<0.05$ ) from the independent sample t-test. Descriptively, the increase in critical thinking skills in the experimental class was also higher than in the control class, indicating the effectiveness of the applied learning model. The contribution of this study lies in strengthening empirical evidence regarding the effectiveness of the Windows Shopping model in developing critical thinking skills at the elementary school level, especially in the context of science learning. This study also enriches educational studies by placing critical thinking skills as the main focus, not just cognitive learning outcomes, thus providing a theoretical and practical foundation for the

development of activity-based and interaction-based learning. Recommendations for further research include expanding the scope of samples across various educational levels and school contexts, examining critical thinking indicators more comprehensively, and combining quantitative and qualitative approaches to gain a deeper understanding of the learning process and its sustainable impact.

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