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The Influence of the Hot Brain Program on Improving Interpersonal Intelligence and Mathematical Logic in Elementary School Students

Landriani Nurdin[1], Hendri Marhadi[1], Muhammad Fendrik[1]

[1] Elementary Education, Riau University, Pekanbaru, Indonesia
landriani.nurdin@grad.unri.ac.id, hendri.marhadi@lecture.unri.ac.id, muhammad.fendrik@lecturer.unri.ac.id
corresponding author: *landriani.nurdin@grad.unri.ac.id*

ABSTRACT

The schoolyard is one of the learning facilities with great potential to be utilized as an active learning space, but in reality, its utilization is still low, which impacts the suboptimal development of interpersonal and mathematical-logical intelligence in elementary school students. This study aims to analyze the influence of the HOT BRAIN program, which is a learning model based on the use of open school spaces, on improving students' interpersonal and mathematical logical intelligence. The research used a quantitative approach with a quasi-experimental pretest-posttest control group design. The study involved two classes: one experimental class that received the HOT BRAIN program treatment and one control class that did not receive the HOT BRAIN program treatment. The research results showed that the experimental group experienced a significant increase in interpersonal intelligence (Sig. < 0.001) and mathematical-logical intelligence (Sig. < 0.001) compared to the control group, thus confirming that the HOT BRAIN program is more effective than conventional learning. In conclusion, the HOT BRAIN program has a positive and significant impact on developing interpersonal and mathematical-logical intelligence in elementary school students thru game-based learning activities, exploration, and social interaction in the open school environment.

Keywords*: *HOT BRAIN, interpersonal intelligence, mathematical logical intelligence, elementary school

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INTRODUCTION

An ideal school is an educational institution capable of facilitating the optimal development of all students' potential, encompassing cognitive, affective, and psychomotor aspects (Tri Noeryanti & Rejekiningsih, 2023). An ideal school not only provides adequate facilities and infrastructure according to Permendikbud Number 24 of 2007 standards, but also creates an enjoyable learning ecosystem (Fitriani et al., 2022). The learning environment in an ideal school accommodates the natural characteristics of elementary school students who are in the concrete operational stage and have a need to move, play, and interact with peers (Adelman & Taylor, 2017). Learning in an ideal school is not limited to the classroom, but rather optimally utilizes the entire potential of the school environment, including the yard, as a meaningful learning resource (Lullulangi et al., 2020).

Characteristics of elementary school students aged 7-12, who have a great need to move, play, and interact with their peers (Suroto, 2024). Developmental psychology studies according to Vygotsky show that at the elementary school age, children learn most effectively thru direct activity and social interaction with peers (Jaggy et al., 2023). Fendrik & Sidik (2022) research states that elementary school students tend to learn thru physical activity and environmental exploration.

The reality on the ground shows that the use of the school environment as an optimal place for learning and playing is still low. Based on the Minister of Education and Culture Regulation Number 24 of 2007 concerning Standards for Facilities and Infrastructure, every elementary school is required to have open space with a minimum area of 3 m² per student. However, field observation results show that the use of schoolyards is still limited to sports and play activities only, and has not been optimized as a meaningful

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learning medium. Learning is still dominated by classroom activities that tend to be monotonous and do not adequately consider children's natural need to move and play in an open environment.

The low utilization of the school environment as a place for learning and play results in low interpersonal and mathematical logical intelligence among students. Learning that does not adequately accommodate social interaction needs and environmental exploration is one of the factors hindering the optimal development of these two aspects of intelligence. Monotonous learning conditions limited to the classroom also reduce students' learning motivation, which impacts their learning outcomes.

Interpersonal intelligence is the ability to understand and interact effectively with others, including the ability to communicate, collaborate, and build positive social relationships (Sinaga & Doang, 2020). Mathematical logical intelligence is the ability to understand patterns, logical relationships, and mathematical concepts (Agustina et al., 2024). The results of the 2022 Program for International Student Assessment (PISA) survey show that the literacy, mathematics, and science abilities of Indonesian students are still below the average of Organization for Economic Cooperation and Development (OECD) countries (Kemendikbud, 2023; OECD, 2023). Specifically, the mathematical abilities of Indonesian students are still low compared to OECD countries, indicating problems in mathematics learning that need to be addressed immediately.

Low interpersonal intelligence and mathematical logic in elementary school students impact various aspects of child development. Students experience difficulty in communicating effectively and collaborating with peers, which impacts their collaborative abilities. Low mathematical logic skills directly affect students' learning outcomes. Monotonous learning reduces students' motivation and interest in learning, making it suboptimal for absorbing learning materials. This condition also results in students being less prepared to face the challenges of the 21st century, which require 4C skills: Critical thinking, Creativity, Communication, and Collaboration, which are essential for meeting future demands.

To address these issues, learning innovations are needed that can optimize the use of the school environment while also developing students' interpersonal intelligence and mathematical logic. The School Page Program for Learning and Playing (HOT BRAIN) was developed as a creative response to the need to create a more enjoyable and meaningful learning environment for elementary school students.

The HOT BRAIN program, with its transformative and innovative concept, is changing the paradigm of schoolyard utilization. Every corner of the schoolyard is designed as a learning zone that accommodates the development of students' interpersonal intelligence and mathematical logic. This program adopts a game-based learning approach tailored to the characteristics of elementary school students, where each learning activity is designed to accommodate children's need for movement, exploration, and social interaction (Hidayatulloh et al., 2023). Thru various systematically designed activities, the HOT BRAIN program facilitates the development of students' multiple intelligences, particularly interpersonal intelligence and mathematical logic. Each activity zone is designed to stimulate both aspects of intelligence thru fun and meaningful learning in an open environment.

The HOT BRAIN program has the potential to be an innovative model that not only addresses the need for a fun learning environment but also supports the more comprehensive achievement of expected competencies, particularly in optimizing the interpersonal intelligence and mathematical logic of elementary school students. Therefore, this research will examine the influence.

LITERATURE REVIEW

HOT BRAIN Program

The Schoolyard Learning and Playing (HOT BRAIN) program is an innovative approach to education that integrates outdoor spaces as an active learning environment. This concept is based on the principle that learning does not always have to take place inside a conventional classroom (Taqwan, 2019). HOT BRAIN views the school grounds as a living laboratory that can comprehensively stimulate students' cognitive, physical, social, and emotional development.

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The HOT BRAIN concept is based on Howard Gardner's theory of multiple intelligences, which continues to evolve in contemporary educational practice. Open environments like schoolyards provide children with opportunities to develop various forms of intelligence, including naturalistic, kinesthetic, interpersonal, and spatial intelligence. This is supported by the research of Kuo et al. (2022) which identified that exposure to the natural environment develops cognitive performance, concentration, and critical thinking skills in students. The HOT BRAIN program also adopts the principles of experiential learning, which are relevant to the needs of the 21st century. According to the study by Natalini et al. (2021) outdoor activities have become an educational priority to ensure psychophysical balance and significant learning. The use of outdoor spaces in the school context can support increased time outdoors with tangible benefits for physical, cognitive, affective-relational, and social well-being, and a reduction in sedentary behavior.

The HOT BRAIN program in the study adopts an approach that combines elements of environmental design with modern student-centered pedagogical principles. The outdoor school space is designed as a thematic learning zone that allows for various forms of exploration and investigation (Mohammed et al., 2024). Implementing HOT BRAIN involves dividing school grounds into thematic areas such as a science garden, an experimental garden, an outdoor art space, and an integrated physical activity zone. Each zone is designed to trigger specific types of learning and exploration that align with the formal curriculum. What distinguishes HOT BRAIN from traditional outdoor learning approaches is the use of design principles based on neuroscience. Learning zones are designed with consideration for how the physical environment can optimize cognitive function. Color, texture, sound, and other elements are integrated to create an environment that promotes optimal conditions for various types of learning and child development.

Interpersonal Intelligence

The term "interpersonal intelligence" was initially developed in 1983 to describe human interaction in a meeting. Interpersonal intelligence refers to the ability to relate well to others and manage relationships. People with interpersonal intelligence are included in the extrovert group (Sadiku et al., 2020). Interpersonal intelligence is the ability to understand the thoughts, attitudes, and behaviors of others. It can also be defined as the ability to understand and distinguish the moods, intentions, motivations, and desires of others, as well as the ability to respond appropriately (Sutarman et al., 2019).

This intelligence is also often referred to as social intelligence, and in addition to the ability to form close friendships with peers, it also includes skills such as leading, organizing, resolving conflicts between friends, and gaining sympathy (Berliana & Atikah, 2023). Referring to the ability to understand and predict the feelings, temperament, mood, intentions, and desires of others. It requires the ability to respond to that situation appropriately. This is the intelligence that allows us to build intimacy, influence, leadership, and relationships with society. Interpersonal intelligence is not something you are born with, but rather something that must be developed thru training and learning, just like other forms of intelligence (Sutarman et al., 2019).

Interpersonal intelligence is also closely related to interpersonal competence, which includes the ability to handle interpersonal challenges and gain satisfaction from social interactions (Klinkosz et al., 2021). This intelligence involves various aspects such as empathy, the ability to solve problems effectively, and good communication skills (Fadhlan et al., 2023). Individuals with this intelligence are able to overcome various challenges in their social interactions and can even feel satisfaction when interacting with others. Important aspects that are components of interpersonal intelligence include the ability to empathize with the feelings of others, skills in effectively resolving problems when dealing with social conflicts, and the ability to communicate clearly and accurately in various situations. These three aspects work together to form a solid foundation for someone to succeed in building relationships with others in various contexts of life. Individuals with this intelligence are able to overcome various challenges in their social interactions and can even feel satisfaction when interacting with others. Important aspects that are components of interpersonal intelligence include the ability to empathize with the feelings of others, skills in effectively resolving problems when dealing with social conflicts, and the ability to communicate clearly and accurately in various situations. These

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three aspects work together to form a solid foundation for someone to succeed in building relationships with others in various contexts of life.

Logical-Mathematical Intelligence

Mathematical logical intelligence is one of the most dominant components of multiple intelligences in mathematics learning because it can be developed in all mathematics topics. Mathematical logical intelligence is a student's ability in numbers and logic, which includes skills in processing words and numbers, using logic and analyzing problems logically, finding formulas, and conducting scientific investigations (Azinar et al., 2020). Mathematical logic provides a rigorous framework for deductive reasoning and plays a fundamental role in the foundations of mathematics and computer science (Bala & Pandey, 2018).

Mathematical logical thinking skills enable students to understand and grasp mathematical problems they encounter, whether difficult or easy. Mathematical thinking is a part of mathematical logical thinking skills (Hasna et al., 2023). Logical-mathematical intelligence is the ability to think systematically, logically, and scientifically, which not only supports learning outcomes in mathematics but also in other fields such as physics, chemistry, and statistics (Nidditch, 2019). This intelligence greatly influences students' ability to solve mathematical problems, especially in logical analysis and mathematical communication, both orally and in writing.

Logical-mathematical intelligence is also important to train from an early age because it is related to problem-solving abilities, logical thinking, and numerical processing skills in everyday life (Sofia et al., 2023). In primary education, this intelligence can be developed thru didactic strategies that encourage the processes of classification, seriation, and understanding patterns and relationships (Márquez Patio et al., 2019). Logical-mathematical intelligence plays an important role in learning mathematics because it involves the ability to process numbers and logic, use logic to analyze problems, find formulas, and conduct scientific investigations (RM et al., 2024). Students with high logical-mathematical intelligence are able to present mathematical statements, construct proofs or solutions, design characteristic patterns or relationships of mathematical phenomena, and logically draw conclusions related to the ideas presented (Prastika et al., 2021).

METHOD

This study uses a quantitative approach with a quasi-experimental method thru a pretest-posttest control group design. The quasi-experimental design was chosen because the researcher could not fully randomize the research subjects, but could still directly compare the group receiving the intervention (experimental group) with the group not receiving the intervention (control group) (Toyon, 2021). The form of this pretest-posttest control group design is as follows:

Table 1. Research Design

Experimental Class	O_1 ***Pre-respond***	*X* ***Treatment***	O_2 ***Post-respond***
Control Class	O_1 ***Pre-respond***	*No* ***Non-Treatment***	O_2 ***Post-respond***

Source: Adapted from the Pretest–Posttest Control Group design (Sugiyono, 2019).

Description
O_1 : *Pre-respond* (before treatment)
O_2 : *Post-respond X* (after treatment)
X : Treatment

Researchers will divide the study sample into two groups with equivalent characteristics. The experimental group will follow the HOT BRAIN program, while the control group will continue with their

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regular teaching and learning activities. Before the treatment, both groups will be given a pretest to measure their initial levels of interpersonal intelligence and mathematical logic. After the treatment period is over, both groups will be measured again thru a posttest to determine the changes that have occurred between the experimental group and the control group. The research instrument indicators used in the pretest and posttest are presented in Table 2 below:

Table 2. Research Instrument Indicators

Variable	Indicator	No Questions
Interpersonal Intelligence	Empathetic attitude	1,2,3
	Tight proposal	4,5,6
	Self-awareness	7,8,9
	Understanding social values	10,11,12
	Effective problem-solving	13,14,15
	Social communication	16,17,18
Logical-Mathematical Intelligence	Arithmetic skills	1,2,3
	Reasoning ability	4,5,6
	Think logically	7,8,9
	Problem solving	10,11,12

Modification: (Asmal, 2020; Qowiyah, 2020)

The subjects of the study were the students of class IV, groups A and B, at SDN 105 Pekanbaru, with 24 students in each group. The research activities will be conducted from August to October 2025. The learning is conducted over four meetings. This activity uses HOT BRAIN for the experimental class and conventional learning for the control class.

RESULTS AND DISCUSSION

The results of the research on the effect of the HOT BRAIN program in improving interpersonal intelligence and mathematical logic of SDN 168 Pekanbaru students are as follows.

Student Interpersonal Intelligence Scores

Based on the results of data analysis regarding the interpersonal intelligence of SDN 168 Pekanbaru students, the data presented in Figure 1 was obtained.

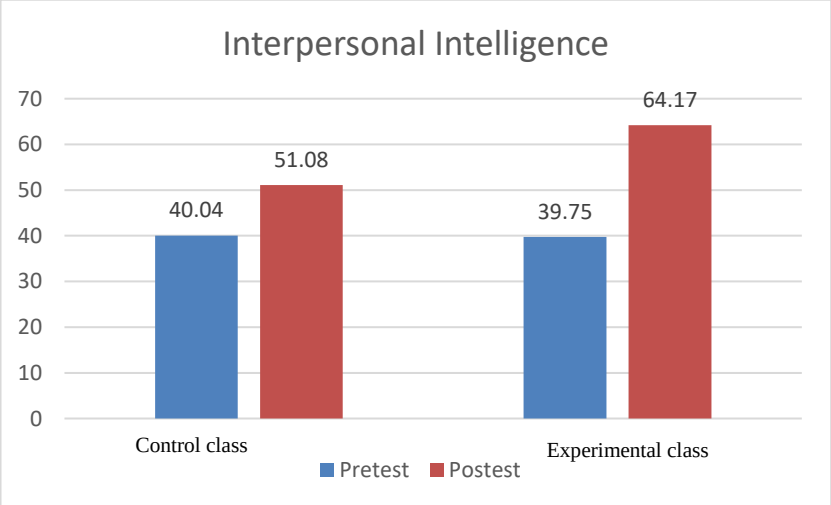

Figure 1. Results of Students' Interpersonal Intelligence Test

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Based on Figure 1 above, the pretest data obtained shows that the control group had an average score of 40.04, while the experimental group had an average score of 39.75. These results indicate that the initial abilities of both groups were at a relatively equal level. In the posttest results, the average score of the control group increased to 51.08, while the experimental group showed a higher average increase, reaching 64.17. Descriptively, these findings indicate that the treatment given to the experimental group had a stronger influence on improving interpersonal intelligence compared to the control group.

Further inferential analysis was conducted to draw conclusions about the population based on the sample behavior. Before conducting a hypothesis test, the data must first be tested using an assumption test. The assumptions tested include: normality test and homogeneity test. The results of the classical assumption tests are presented in the table below.

Table 3. Normality Test for Interpersonal Intelligence Variable

Kelas	Statistic	Df.	Sig.
Pretest A (Control)	0.917	24	0.051
Postest A (Control)	0.919	24	0.057
Pretest B (Experiment)	0.931	24	0.102
Postest B (Experiment)	0.967	24	0.590

Source: SPSS 27

Based on Table 3 above, the Shapiro-Wilk normality test for significance values is explained as follows:

a. In the control group pretest, the significance value is 0.051 > 0.05, which means the data is normally distributed.
b. b. In the control group posttest, the significance value is 0.057 > 0.05, which means the data is normally distributed.
c. c. In the experimental group pretest, the significance value is 0.102 > 0.05, which means the data is normally distributed.
d. d. In the experimental group pretest, the significance value is 0.590 > 0.05, which means the data is normally distributed.

Based on the results above, it can be concluded that the interpersonal intelligence variable data is normally distributed. Thus, it meets the basic assumptions for further analysis using parametric statistical techniques. Next, a homogeneity test was conducted to determine the homogeneity of the data variance or to ensure that both classes had equal initial abilities. The results of the homogeneity test are presented in the table below.

Table 4. Homogeneity Test of Students' Interpersonal Intelligence

Based on Mean	1.028	1	46	0.316
Based on Median	1.103	1	46	0.299
Based on Median and with adjusted df	1.103	1	41.779	0.300
Based on trimmed mean	1.124	1	46	0.295

Source: SPSS 27

Table 4 shows the results of the interpersonal intelligence homogeneity test for students using Levene's Test. Based on calculations using the mean, median, median with adjusted df, and trimmed mean, the significance value obtained ranged from 0.295 to 0.316. All of these significance values are above 0.05, which means the variance of interpersonal intelligence in the experimental group and the control group is homogeneous. Therefore, both groups have an equal distribution of variance.

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After conducting classical assumption tests, it was concluded that the data met the requirements for parametric statistical tests. Therefore, testing the interpersonal intelligence hypothesis uses the independent samples t-test, a parametric statistical test, which is presented in the following table:

Table 5. Independent Samples T-test for Interpersonal Intelligence Variable

Class	N	Mean	Std. Deviation	Sig. (2-tailed)
Control Class	24	51.08	8.978	< 0,001
Experimental Class	24	64.17	2.408	

Source: SPSS 27

Table 5 shows the results of the Independent Sample t-Test, which indicates a significant difference in students' interpersonal intelligence between the control and experimental groups. The significance value (Sig. 2-tailed) is < 0.001, which is less than 0.05, indicating a significant difference between the two groups. The average interpersonal intelligence of the control class was 51.08, while the experimental class reached 64.17, indicating a higher improvement in the group that received the HOT BRAIN program treatment. Based on these results, H_0 was rejected and H_1 was accepted, which means that the HOT BRAIN program had a significant and positive effect on improving the interpersonal intelligence of elementary school students.

Student's Mathematical Logical Intelligence Scores

Based on the results of data analysis regarding the mathematical logical intelligence of SDN 168 Pekanbaru students, the data presented in Figure 2 was obtained.

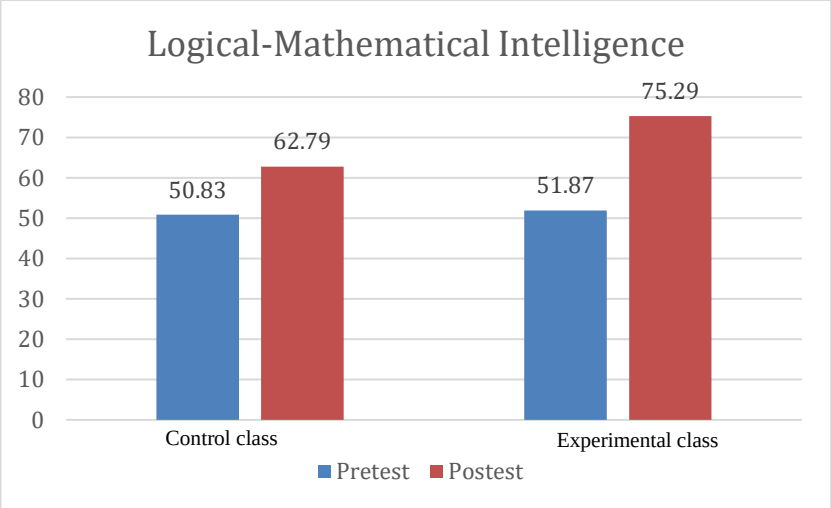

Figure 2. Results of the Mathematical Logic Intelligence Test

Based on Figure 2 above, the pretest data obtained shows that the control group had an average score of 50.83, while the experimental group had an average score of 51.87. These results indicate that the initial abilities of both groups were at a relatively equal level. In the posttest results, the average score of the control group increased to 62.75, while the experimental group showed a higher average increase, reaching 75.29.

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Descriptively, these findings indicate that the treatment given to the experimental group had a stronger influence on improving mathematical logical intelligence compared to the control group.

Further inferential analysis was conducted to draw conclusions about the population based on the sample behavior. Before conducting a hypothesis test, the data must first be tested using an assumption test. The assumptions tested include: normality test and homogeneity test. The results of the classical assumption tests are presented in the table below:

Table 6. Normality Test for Mathematical Logical Intelligence Variable

Class	Statistic	Df.	Sig.
Pretest A (Control)	0,696	24	<.001
Postest A (Control)	0,713	24	<.001
Pretest B (Experiment)	0,689	24	<.001
Postest B (Experiment)	0,708	24	<.001

Source: SPSS 27

Based on Table 6 above, the Shapiro-Wilk normality test for significance values is explained as follows:

a. In the control group pretest, the significance value is 0.001 < 0.05, which means the data is not normally distributed.
b. In the control group posttest, the significance value is 0.001 < 0.05, which means the data is not normally distributed.
c. In the experimental group pretest, the value obtained is 0.001 < 0.05, which means the data is not normally distributed.
d. In the experimental group pretest, the significance value obtained is 0.001 < 0.05, which means the data is not normally distributed.

Based on the results above, it can be concluded that the data for the mathematical logical intelligence variable is not normally distributed. Therefore, it does not meet the basic assumptions for further analysis using parametric statistical techniques. Next, a homogeneity test was conducted to determine the homogeneity of the data variance or to ensure that both classes had equal initial abilities. The results of the homogeneity test are presented in the table below.

Table 7. Homogeneity Test of Mathematical Logical Intelligence

Based on Mean	1.028	1	46	0,316
Based on Median	1.103	1	46	0,299
Based on Median and with adjusted df	1.103	1	41.779	0,300
Based on trimmed mean	1.124	1	46	0,295

Source: SPSS 27

Table 7 shows the results of the interpersonal intelligence homogeneity test for students using Levene's Test. Based on calculations using the mean, median, median with adjusted df, and trimmed mean, the significance value obtained ranged from 0.295 to 0.316. All of these significance values are above 0.05, which means the variance of interpersonal intelligence in the experimental group and the control group is homogeneous. Therefore, both groups have an equal distribution of variance.

After conducting classical assumption tests, it was concluded that the data did not meet the requirements for non-parametric statistical tests. Therefore, testing the students' mathematical logical

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intelligence hypothesis using the non-parametric Mann-Whitney statistical test is presented in the following table.

Table 8. Mann-Whitney U Test for Mathematical Logical Intelligence Variable

Mann-Whitney U	137.500
Wilcoxon W	437.500
Z	-3.210
Asymp. Sig. (2-tailed)	0,001

Source: SPSS 27

Table 8 shows the results of the Independent Sample t-Test, which indicates a significant difference in students' interpersonal intelligence between the control and experimental groups. The significance value (Sig. 2-tailed) is < 0.001, which is less than 0.05, indicating a significant difference between the two groups. The average interpersonal intelligence of the control class was 51.08, while the experimental class reached 64.17, indicating a higher improvement in the group that received the HOT BRAIN program treatment. Based on these results, H_0 was rejected and H_1 was accepted, which means that the HOT BRAIN program had a significant and positive effect on improving the interpersonal intelligence of elementary school students.

Discussion

The results of this study indicate that HOT BRAIN has a positive and significant effect on students' interpersonal intelligence and mathematical logical intelligence. This finding illustrates that learning activities that combine open spaces, educational games, and directed social interaction can improve students' ability to build relationships, communicate, cooperate, solve problems, and increase empathy. This aligns with the research findings of Setiawati et al. (2023) which state that learning using an outdoor system can increase students' learning motivation and provide opportunities for students to communicate and collaborate with other students due to the more cooperative and enjoyable learning atmosphere. This is also supported by the opinion of Nursyamsi et al. (2024) who stated that outdoor learning methods are suitable for improving students' communication skills and social interaction.

Additionally, this finding also indicates that learning activities conducted thru the HOT BRAIN approach are able to stimulate students' logical thinking, problem-solving, calculation skills, and reasoning more effectively than conventional learning. This finding aligns with the opinion (Paulina et al., 2023) that game-based learning can create a positive learning atmosphere. Students who experience a positive learning atmosphere tend to be more enthusiastic about participating in learning activities, making it easier for them to understand mathematical concepts and develop critical thinking and problem-solving skills more optimally.

This increase in interpersonal intelligence and mathematical logical intelligence aligns with the theory of multiple intelligences proposed by Gardner (1983), which asserts that interpersonal intelligence develops optimally thru social situations that facilitate collaboration and interaction among students, while mathematical logical intelligence develops when students are given the opportunity to explore patterns, relationships, classifications, problem-solving, and the manipulation of numerical symbols (Jumiatin et al., 2020). Additionally, interpersonal intelligence is also put forward by Musfiroh: "This intelligence is characterized by the ability to accurately perceive and respond to the moods, temperaments, motivations, and desires of others. Someone who is optimal in this intelligence tends to enjoy and be effective in nurturing and educating others, communicating, interacting, empathizing and sympathizing, leading and organizing groups, making friends, resolving and mediating conflicts, respecting the opinions and rights of others, seeing things from various perspectives, being sensitive to the interests and motives of others, and being skilled at working in teams." (Musfiroh, 2014). The open and collaborative HOT BRAIN environment provides a real space for students to practice communicating, expressing opinions, understanding their peers' perspectives, and solving problems together.

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Additionally, the game-based learning approach used in the HOT BRAIN program has proven capable of creating a more enjoyable and less stressful learning environment. This condition encourages students to participate more actively, build positive relationships, and increase their courage to interact. Outdoor activities provide authentic experiences that encourage students to collaborate, discuss, and solve challenges together. This finding is supported by the statement made by Miss Pocenter in (Nurleha & Kristiana, 2025) which states that implementing play-based learning has a significant impact on stimulating students' social skills. Miss Pocenter also stated that children who engage in play activities are more easily adaptable in social environments, have higher self-esteem, and are able to cooperate with peers. One Miss Pocenter mentioned: "Children who frequently engage in role-playing or group games learn to share and communicate with their friends more quickly. They are also more patient in waiting for their turn and understanding the rules of the game." The process of playing together also serves as a natural means for students to practice empathy, respect group rules, and work in teams, all of which are key indicators of interpersonal intelligence. Increased learning motivation also impacts students' mental readiness to think critically, analyze, and solve problems – key competencies in logical-mathematical intelligence. The process of learning thru play also provides opportunities for students to repeat strategies, engage in trial and error, and independently evaluate results.

Thus, it can be concluded that HOT BRAIN is a relevant and positively impactful learning strategy for developing students' interpersonal and mathematical logical intelligence. Implementing this program in schools can be an innovative learning solution to support students' social competence development, especially in facing the demands of the 21st century, which emphasize collaboration, communication, and teamwork skills, and increase students' mental readiness to think critically, analyze, and solve problems.

CONCLUSIONS AND RECOMMENDATION

Based on the research findings regarding the implementation of the Schoolyard Learning and Playing (HOT BRAIN) Program in developing interpersonal intelligence and mathematical logic in elementary school students, it can be concluded that this program was successfully implemented and had a significant positive impact. HOT BRAIN is able to create a fun, active, and experience-based learning environment by utilizing open school spaces and educational games integrated with learning. Thru a series of collaborative activities and social interactions, students demonstrated improved abilities in communication, cooperation, empathy, and positive social problem-solving, leading to a tangible development of their interpersonal intelligence. Additionally, the program proved to enhance students' mathematical logical intelligence, as reflected in their ability to think logically, recognize patterns, calculate, and solve problems thru contextually designed mathematical games and exploratory activities. The results of the statistical analysis also show that HOT BRAIN has a significant impact on both aspects of intelligence. Overall, HOT BRAIN is an innovative, effective, and relevant learning model that supports the development of elementary school students' multiple intelligences.

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