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Motivation to Learn Science in Students Affected by the Online Game Roblox in Grade 5.

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Abstract

The increasing intensity of online game usage among elementary school students, particularly Roblox, raises concerns about a potential decline in learning motivation, especially in subjects requiring high concentration such as Natural and Social Sciences (IPAS) within the Merdeka Curriculum. This study aims to describe the IPAS learning motivation of fifth-grade students affected by the online game Roblox at SD Negeri 158 Palembang. The method used was descriptive quantitative with a purposive sampling technique, involving 32 fifth-grade students who actively played Roblox at least three times a week over the past three months. Data were collected through two 1–5 Likert scale questionnaires, each consisting of 30 statement items for the variables of playing intensity and IPAS learning motivation, which were then analyzed using descriptive statistics including mean, median, mode, standard deviation, and achievement percentage.

Keywords: IPAS learning motivation; Roblox online games; elementary school students; playing intensity; Merdeka Curriculum.

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INTRODUCTION

The massive development of information and communication technology over the past few decades has brought fundamental changes to various sectors of life, one of which is education. Education is required to adapt to technological dynamics so that the learning process remains aligned with the needs and characteristics of a generation growing up in a digital environment.

Technology-based applications found on gadgets are increasingly diverse, one of which is online games. Positively, online games can be a source of entertainment for children, provide a wealth of new knowledge, train problem-solving skills, and develop social skills online (Lukmana & Djamaluddin, 2023).

Some of the most popular games include Mobile Legends, Free Fire, Clash of Clans, PUBG, and Roblox. Among these platforms, Roblox is one of the most popular online gaming applications among elementary school students because it allows users to not only play but also create their own games. Furqon (2020) added that Roblox is a highly addictive online game because it offers a wide variety of games on one platform, thus keeping players interested and playing non-stop.

*Roblox*First created in 2004 by David Baszucki and Erik Cassel in San Mateo, California, Roblox has transcended its role as a gaming platform and transformed into a multi-functional digital space. From virtual classrooms to global business activities, Roblox demonstrates that the digital world can provide innovative solutions in education, business, and collaboration. As technologies like Virtual Reality (VR) and Artificial Intelligence (AI) develop, Roblox's potential is predicted to continue to grow without limits.

The Roblox game itself has two impacts, namely positive and negative. On the positive side, Roblox can function as a medium and means of entertainment for students. Several research results also show that certain online games can contribute to increasing intellectual intelligence (IQ) and help strengthen students' memory. However, on the other hand, Roblox also has negative impacts that need to be considered. Among these is the tendency for students to lose track of time and spend hours playing, which leads to addiction. As mentioned by Irawan & Siska W (2021), there are three factors that influence online game addiction in students, including: (1) frequency of playing online games; (2) time playing online games; (3) favorite games. The frequency of students playing online games can be measured by how often or how long students play online games in a certain period of time. In addition, excessive game use can also affect the moral aspects and social behavior of students.

They can exhibit selfish, stubborn, self-centered behavior, and withdraw from social

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settings, rarely interacting with those around them (Amalia, Hakim, and Hera, 2022). The phenomenon of online game addiction has spread to elementary school students, causing them to focus solely on gaming, often neglecting their studies or other important matters (Amalia, Hakim, and Hera, 2022). Learning activities that are no longer prioritized by a student indicate a low level of motivation.

Learning motivation can be defined as an internal or external drive a person possesses to take action to achieve learning goals (Hanum et al., 2022). In the context of basic education, learning motivation is a crucial factor in determining students' success in understanding and mastering subject matter. According to (Idris and Irawan, 2025), learning motivation is a crucial factor in determining student engagement in the learning process. Students with high learning motivation tend to be more active, enthusiastic, and able to maintain focus throughout the learning process. Good motivation also plays a role in improving learning outcomes and achieving learning goals.

Highly motivated students will demonstrate interest, attention, and active participation in the learning process. Conversely, low motivation can lead to boredom, lack of focus, and difficulty achieving optimal learning outcomes. However, amidst the rapid development of digital technology, new challenges have emerged that can impact student motivation, one of which is the increasing use of gadgets and online games. In addition to impacting motivation and learning outcomes, excessive use of online games also impacts children's psychological and social aspects.

Low student interest in science learning is caused by the lack of engaging learning media. This causes students to become bored with the material being taught by teachers. To address this issue, teachers must use engaging learning media to pique students' interest, namely by using learning media.(Mira, Idris, & Irawan, 2023). Education system updates through technology, curriculum, and learning methods are carried out to create an interesting learning process, so that it can foster and increase students' interest in learning in the digital era.(Handayani, Idris, & Irawan, 2025).

In line with Mubaroq, YP's (2025) research entitled "The Impact of Roblox Online Games on Student Learning Motivation - Case Study at Setia Darma 04 Elementary School" the results showed that Roblox Online Games have a dualistic impact on student learning motivation. On the one hand, Roblox provides a positive impact in the form of increased curiosity, enthusiasm for learning, and students' ability to access more diverse learning resources. However, on the other hand, Roblox also provides . This study has similarities in the objects studied, namely learning motivation and Roblox Online Games. The difference is that previous research did not focus on

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science motivation in grade V of elementary school.

In the research of Prasetyo, A., Rondli, WS, & Ermawati, D. (2023), entitled "The Impact of Online Games on Elementary School Students' Learning Achievement", it shows that the impact of Online Games on students' learning achievement has decreased learning achievement. The similarity of this study is that both of them examine the impact of Online Games. The difference is that the previous study examined the impact of Online Games on learning achievement, while this study examines the motivation to learn Science in grade V of elementary school on the Online Game Roblox.

In the research of Aprianto, I., & Dafit, F. (2022), entitled "The Impact of Online Games on Elementary School Student Learning", the results of this study indicate that online games have both positive and negative impacts. The negative impact is that children who play games with high intensity have an impact on their grades at school. The similarity of this study is that both examine the impact of online games on students. The difference is that the previous study examined the impact of online games on the learning of fourth-grade elementary school students, while this study examines the motivation to learn science in fifth-grade elementary school, specifically the online game Roblox.

According to Fariha (2023) in her research on "The Influence of Online Games on Student Learning Motivation", it can be obtained that the activity of playing Online Games has been proven to have a significant influence on learning motivation. The results of the analysis show that the significance value is at 0.00 with a t-value of 7.858, which means there is a real relationship between the intensity of playing Online Games and student learning motivation. In addition, the strength of the relationship between the two is classified as moderate with a correlation value of 0.677. This finding confirms that the higher the intensity of playing Online Games, the greater the influence on changes in student learning motivation, both in the form of increases and decreases, depending on how students utilize these playing activities. The difference in this research is that this research focuses on describing student learning motivation affected by online games and the research was conducted on fifth grade students and focused on the Roblox Online Game, while the previous research was conducted on fourth grade students on all types of Online Games.

According to Waqi and Nisa (2024) in their study entitled "The Effect of Online Games on Elementary School Students' Learning Motivation", it can be found that excessive use of Online Games has a significant impact on decreasing elementary school students' learning motivation. These findings confirm that the intensity of playing Online Games has a direct relationship with decreasing learning motivation in elementary school students. The similarity of this study is that

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both examine Online Games on elementary school students' learning motivation. The difference is that this study focuses on the description of learning motivation in students, not the influence of online games on student learning motivation and is specifically for fifth grade elementary school students.

Based on previous research, it can be concluded that online games generally have a significant impact on students' learning motivation. However, previous studies have not specifically examined learning motivation in science subjects or the impact of the online game Roblox specifically on fifth-grade elementary school students. Most studies only examine learning motivation in general and have not focused on specific subjects.

This study is novel compared to previous studies because it focuses on the motivation to learn science in fifth-grade elementary school students affected by the online game Roblox. Furthermore, this study was conducted at SD Negeri 158 Palembang, located in the city center with high technology exposure, making students more susceptible to intense online game play.

Based on observations conducted by researchers at SD Negeri 158 Palembang, many students, especially in grade 5, admitted to frequently spending time playing Roblox after school, some even playing the game until late at night. Furthermore, after a brief interview with the class teacher, it was stated that almost all students experienced a decrease in concentration during the lesson, especially in science subjects. This was evident from the lack of student attention when the teacher explained the material, as well as a decrease in active participation in learning activities. The observation also showed that some students tended to procrastinate on assignments, and almost all students talked more often about games than the lesson material during discussions.

This condition indicates a tendency for decreased learning motivation influenced by the intensity of online game play. This is evident in decreased concentration during learning, a lack of initiative in completing assignments, and a tendency for students to be more enthusiastic about discussing games than science subjects. Therefore, this study was conducted to provide an overview of the extent of motivation to learn science among fifth-grade elementary school students affected by the online game Roblox. It also calls on teachers and parents to better supervise and guide students' positive use of technology to support the learning process at school.

RESEARCH METHODOLOGY

This study uses a quantitative approach with a descriptive (non-experimental) survey method design to systematically measure and describe phenomena without providing special

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treatment. The subjects of this study were 32 fifth-grade students at SD Negeri 158 Palembang in the 2025/2026 academic year who were selected using a purposive sampling technique. The subject selection criteria included: students with active status at the school, playing the online game Roblox at least three times a week, having played for at least the past three months, and being able to fill out the questionnaire properly. The objects of study specifically focused on two variables, namely the level of intensity of playing Roblox and the level of student learning motivation in the subject of science.

The primary data collection technique used a closed-ended questionnaire with a 1–5-point Likert scale. Two types of questionnaires were distributed: a 30-item questionnaire to measure Roblox playing intensity (focusing on duration and frequency) and a 30-item questionnaire, both positive and negative, to measure science learning motivation (focusing on intrinsic and extrinsic motivation). In addition to the questionnaire, this study also used documentation techniques to collect supporting data, such as photographs of student activities during the data collection process at school.

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RESULTS AND DISCUSSION

RESULTS

This research was conducted on fifth-grade students consisting of two classes with a total of 50 respondents. The data obtained in this study are:

1. Roblox Online Game Playing Intensity (Variable X)



Figure 1.Roblox Online Game Playing Intensity Questionnaire

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Based on the distributed questionnaire, it was found that 32 students play the online game Roblox. The intensity questionnaire was administered to 32 respondents using a Likert scale ranging from 1 to 5, resulting in a maximum score of 150 per item.

2. Motivation to learn science (Variable Y)



Picture1. Roblox Online Game Playing Intensity Questionnaire

The motivation questionnaire was distributed to 32 respondents using a Likert scale ranging from 1 to 5, so that the maximum score per item was 150.

Descriptive Analysis Results

Based on the results of processing the questionnaire data, the following picture was obtained:

1) Roblox Playing Intensity

Descriptive analysis was conducted to obtain a comprehensive overview of the distribution of responses to each item, including the total score, mean, median, mode, standard deviation, and percentage of achievement. The percentage of achievement was categorized into three groups: high (≥80%), moderate (60–79%), and low (<60%). Overall, the average achievement of the intensity questionnaire was 60.67%, falling into the moderate category, with an average score of 3.03 and a standard deviation of 1.41.

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Table1.Mean, Median, Mode, Standard Deviation of Roblox Online Game Playing Intensity

Statistics																
		X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11	X12	X13	X14	X15
N	Valid	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
	Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean		3,31	3,31	3,59	3,50	3,28	3,50	2,28	2,09	2,59	3,16	3,88	3,31	2,50	2,63	3,38
Median		3,21[a]	3,35[a]	3,92[a]	3,73[a]	3,38[a]	3,69[a]	1,90[a]	1,65[a]	2,40[a]	3,29[a]	4,13[a]	3,42[a]	2,00[a]	2,53[a]	3,55[a]
Mode		3	3	5	5	5	4[b]	1	1	2	3[b]	5	5	1	1[b]	5
Std. Deviation		1,091	1,256	1,411	1,414	1,442	1,344	1,397	1,489	1,292	1,483	1,238	1,424	1,626	1,362	1,540

		X16	X17	X18	X19	X20	X21	X22	X23	X24	X25	X26	X27	X28	X29	X30
N	Valid	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
	Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean		3,44	2,75	2,53	3,38	3,28	3,13	2,75	3,25	2,66	2,44	3,31	2,88	2,72	3,22	3,03
Median		3,62[a]	2,64[a]	2,31[a]	3,38[a]	3,38[a]	3,00[a]	2,67[a]	3,43[a]	2,50[a]	2,20[a]	3,35[a]	2,81[a]	2,70[a]	3,45[a]	3,00[a]
Mode		5	1[b]	1	3	3	5	3	5	1	1	3	3	1	5	3
Std. Deviation		1,413	1,459	1,436	1,289	1,373	1,540	1,391	1,685	1,473	1,413	1,306	1,338	1,508	1,560	1,356

Of the 30 items on the intensity questionnaire, the majority fell into the Medium category, with achievement percentages ranging from 60–79%. The item with the highest score was question 11 (77.50%), indicating a fairly positive response from respondents to this aspect. Conversely, the lowest achievement scores were recorded for questions 8 (41.88%) and 7 (45.62%), which fell into the Low category. This pattern indicates an intensity dimension that still requires further attention.

2) Motivation to Learn Science

Descriptive analysis of the learning motivation variable was conducted based on questionnaire data collected from 32 respondents using a Likert scale instrument with a score range of 1 to 5. The instrument consisted of 30 statements, so that the total score for each respondent was in the range of 30 to 150. The categorization of learning motivation refers to seven established category levels, ranging from "No Motivation" to "Very High". The results of descriptive statistical calculations show that the average score (mean) of learning motivation for all respondents reached 103.84, with a median value of 99.00. The lowest score obtained was 78 and the highest score reached 150. The standard deviation of 15.54 indicates that there is quite a wide variation in the level of learning motivation among respondents. In percentage terms, the

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average score achieved reached 69.2% of the maximum ideal score of 150.

Table 2.Mean, Median, Mode, Standard Deviation of Science Learning Motivation

Statistics															
		Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14	Y15
N	Valid	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
	Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean		4,34	4,03	2,78	4,25	2,53	3,97	2,41	3,34	3,69	2,34	3,91	2,72	4,03	3,78	4,19
Median		4,00	4,00	3,00	5,00	2,00	4,00	2,00	3,00	4,00	2,00	4,00	2,00	4,00	4,00	4,00
Mode		5	5	3	5	2[a]	5	1	3	4	1	5	2	5	5	5
Std. Deviation		,701	,967	1,263	1,078	1,295	,897	1,341	1,260	1,061	1,428	,963	1,420	,933	1,184	,859
		Y16	Y17	Y18	Y19	Y20	Y21	Y22	Y23	Y24	Y25	Y26	Y27	Y28	Y29	Y30
N	Valid	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
	Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean		3,81	3,81	2,75	3,31	3,03	3,91	3,66	3,88	2,56	4,19	2,38	3,41	2,72	3,84	4,28
Median		4,00	4,00	2,50	3,00	3,00	4,00	4,00	4,00	2,00	4,00	2,00	4,00	2,00	4,00	5,00
Mode		3	4	2	3	2[a]	5	3[a]	5	1	5	2	4	2	4	5
Std. Deviation		,931	,965	1,414	1,061	1,282	1,088	1,234	1,264	1,523	1,061	1,238	1,266	1,397	,987	,888

Table 3.Mean, Median, Mode, Standard Deviation of Overall Motivation for Learning Science

N	Mean	Median	Mode	Elementary School	% Achievement
32	118.81	119.00	—	15.54	79.21%

Of the 30 questions in the Science learning motivation questionnaire, most of the items were in the High category with achievement percentages above 80%. The item with the highest score was question number 15 (88.12%), which measures the need to meet parental or teacher expectations, followed by questions 29 and 30 (86.88% each). The one item with the lowest percentage was question number 28 (40.00%), which is a negative item. After reverse scoring, this low score indicates that some students tend to seek instant gratification from games rather than long-term rewards from learning. Overall, the average Science learning motivation score per respondent was 118.81 out of a maximum score of 150, with an achievement percentage of 79.21%, which is included in the High category.

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Table 4.Recapitulation of Per Dimension of Science Learning Motivation

Dimensions	Total Score	Average Per Respondent	% Achievement	Category
Intrinsic Motivation (Questions 1-15)	1,910	59.69 / 75	79.58%	Currently
Extrinsic Motivation (Questions 16-30)	1,892	59.12 / 75	78.83%	Currently
Total	**3,802**	**118.81 / 150**	**79.21%**	**Tall**

DISCUSSION

Overview of Roblox Online Game Playing Intensity of Fifth Grade Students at State Elementary School 158 Palembang

Based on the data analysis, the intensity of Roblox online game playing among fifth-grade students at SD Negeri 158 Palembang is in the moderate category, with an average score of 91.00 out of a maximum score of 150 and a percentage achievement of 60.67%. These results indicate that students have played Roblox with sufficient frequency and duration, but have not yet reached a level categorized as high or indicating severe addiction.

A closer look reveals that items measuring the duration and frequency of play during school days (questions 7, 8, and 9) achieved low achievement percentages (below 55%), indicating that students tend to reduce the intensity of play during school days. Conversely, items measuring the duration of play during holidays (questions 11, 12, 15, and 16) achieved higher achievement percentages, indicating that students play Roblox more during non-school periods.

This is in line with the opinion of Cowie (1994) in Mochamad Rizal Alfianto (2024) who stated that the intensity of playing online games can be measured through two aspects, namely quantity (duration) and activity (frequency). The frequency of playing is classified as moderate (3-5 times per week) and the duration of playing varies between 1-3 hours per day indicates that students can still divide their time between playing and other activities, although further supervision is needed so that it does not increase to a high category that has the potential to have a negative impact on learning activities.

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This finding also aligns with research by Irawan and Siska W (2021), which explains that three factors influence the intensity of online game play in students: frequency, playing time, and preferred game types. Roblox, as a gaming platform that offers a variety of games in one platform, makes it highly appealing and has the potential to gradually increase students' playing intensity if not balanced with adequate supervision from parents and teachers.

An Overview of Students' Motivation to Learn Science Affected by the Online Game Roblox

The results of the study showed that the motivation to learn science among fifth-grade students of SD Negeri 158 Palembang who played the Roblox online game was in the High category, with an average score of 118.81 out of a maximum score of 150 and an achievement percentage of 79.21%. This finding indicates that even though students were exposed to the Roblox online game with moderate intensity, their learning motivation in the science subject was generally well maintained.

The intrinsic motivation dimension obtained an average score of 59.69 out of a maximum score of 75 per respondent (79.58%), while the extrinsic motivation dimension obtained an average score of 59.12 out of a maximum score of 75 (78.83%). Both dimensions showed a relatively balanced level, which means that both internal and external motivations from students play an important role in maintaining motivation to learn science.

The motivational indicators that achieved the highest scores were items measuring the need to meet parental or teacher expectations (question 15, 88.12%), the desire and aspiration to succeed in learning (question 1, 86.88%), and hopes and aspirations for the future (question 29, 86.88%). This indicates that external factors such as family support and future orientation are the strongest motivators for students to continue learning even though they enjoy playing Roblox.

One interesting finding was question number 28 (a negative item, after reverse scoring), which achieved the lowest achievement percentage, at 40.00%. This item measures students' tendency to seek instant gratification rather than long-term rewards from learning. The large number of students who agreed with this negative statement indicates that some respondents felt the allure of instant rewards from games made the learning process less engaging. However, overall, this did not significantly reduce learning motivation to a worrying level.

The results of this study align with the findings of Mubaroq, YP (2025), who stated that the online game Roblox has a dualistic impact on students' learning motivation. On the one hand, Roblox has a positive impact in the form of increased curiosity and enthusiasm for learning. On the other hand, Roblox also has negative impacts such as the emergence of laziness in learning,

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procrastination in completing assignments, and impaired concentration in class. This study found a similar condition, where most students were still able to maintain high learning motivation despite the pressure of playing games.

This finding is also consistent with the view of Dimyati and Mudjiono (2020), who explained that student learning motivation is influenced by many factors, both internal and external. External factors such as parental support, teacher guidance, and a conducive school environment have been proven to be able to maintain student learning motivation even though they are exposed to digital stimulation from the Roblox Online Game. In general, the motivation to learn science is in the High category with Roblox playing intensity in the Medium category, indicating that at the moderate intensity stage, the negative impact of games on learning motivation has not yet fully penetrated to a critical level.

CONCLUSION

Based on the research results and discussions that have been explained in the previous chapter regarding the motivation to learn science in students affected by the Roblox Online Game in class V of SD Negeri 158 Palembang, the following conclusions can be drawn.

1) The intensity of playing the Roblox Online Game among fifth-grade students of SD Negeri 158 Palembang who were the respondents of the study was in the Moderate category, with an average score of 91.00 out of a maximum score of 150 and an achievement percentage of 60.67%. Students played Roblox with a higher frequency on holidays than on school days, as indicated by the percentage of achievement of items measuring school day intensity (question 7: 45.62% and question 8: 41.88%) which was much lower than the holiday item (question 11: 77.50%). Although the intensity of playing has not reached the level of addiction, this condition needs attention because it has the potential to increase and disrupt learning activities if not balanced with proper supervision.
2) The motivation to learn science in fifth grade students of SD Negeri 158 Palembang who play the Roblox Online Game is in the High category, with an average score of 118.81 out of a maximum score of 150 and an achievement percentage of 79.21%. The intrinsic motivation dimension achieved an achievement of 79.58% and the extrinsic motivation dimension of 78.83%, both showing a relatively balanced level. The most dominant motivational factors are the need to meet parents' or teachers' expectations (question 15, 88.12%), the desire and desire to succeed (question 1, 86.88%), and hopes and aspirations in the future (question 29, 86.88%). Although some students show a tendency to seek

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instant gratification from games (reflected in the low score of the negative item question 28, 40.00%), overall their motivation to learn science is still maintained at a High level thanks to the strong support of external factors.

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