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THE RELATIONSHIP BETWEEN ONLINE GAME ADDICTION AND ACADEMIC ACHIEVEMENT OF E-SPORTS STUDENTS

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Abstract: *Online games have become a popular form of entertainment among adolescents and may lead to addiction, potentially affecting academic achievement. This study aimed to analyze the relationship between online game addiction and students' academic achievement at SMA Negeri 4 Tanjung Jabung Timur. A quantitative correlational design with a cross-sectional approach was applied. The study involved 46 students in grades XI and XII who played online games and participated in e-sports activities, selected using total sampling. Data were collected using the Game Addiction Scale (GAS-21) and students' report cards, then analyzed using SPSS with the Kendall's Tau test. The results showed that most students had severe addiction levels and good academic achievement Statistical analysis revealed a strong and significant negative correlation between online game addiction and academic achievement indicating that higher addiction levels are associated with lower academic performance.*

Abstrak: Permainan Online telah menjadi bentuk hiburan populer di kalangan remaja dan dapat menyebabkan kecanduan, yang berpotensi memengaruhi prestasi akademik. Penelitian ini bertujuan untuk menganalisis hubungan antara kecanduan permainan daring dan prestasi akademik siswa di SMA Negeri 4 Tanjung Jabung Timur. Desain korelasional kuantitatif dengan pendekatan cross-sectional diterapkan. Penelitian ini melibatkan 46 siswa kelas XI dan XII yang bermain permainan daring dan berpartisipasi dalam kegiatan e-sports, yang dipilih menggunakan total sampling. Data dikumpulkan menggunakan Skala Kecanduan Permainan (GAS-21) dan rapor siswa, kemudian dianalisis menggunakan SPSS dengan uji Kendall's Tau. Hasil menunjukkan bahwa sebagian besar siswa memiliki tingkat kecanduan yang parah dan prestasi akademik yang baik. Analisis statistik mengungkapkan korelasi negatif yang kuat dan signifikan antara kecanduan permainan daring dan prestasi akademik menunjukkan bahwa tingkat kecanduan yang lebih tinggi dikaitkan dengan prestasi akademik yang lebih rendah.

INTRODUCTION

The internet has provided countless benefits to people of all ages, from children to adults. One such benefit is entertainment. Online games are among the most popular forms of internet entertainment. These games are digital games that can only be played when the device is connected to the internet (Rini, 2020). The development of online games has been influenced by advances in computer technology and the internet. The rise of online games reflects the rapid development of networks, which began as small-scale networks and evolved into the internet, and continues to grow today. This ease of access can have negative consequences if not addressed properly. Research shows that adolescents are the age group most likely to face technology-related problems (Kurniawati & Tambakreja, 2020).

Mobile Online Battle Arena (MOBA) is among the most played games by online gamers in Indonesia. The most popular and widely played MOBA game is Mobile Legends (Pratama & Nugroho, 2023). Online games are popular among all ages, from young to old, and even children. The main attraction of online games is the limited time available, which further piques the player's curiosity. When someone becomes too involved in online games, they lose track of time and find it difficult to stop (Mulyani & Fitriani, 2022). Playing games for a long time can also make someone become addicted (Lebho et al., 2020). A person is said to be addicted if they spend all day and for a long period of time, namely more than 3 hours at a time, just playing online games (Kim, 2020).

While playing online games is often considered a less productive activity, online games still have a number of positive impacts, particularly competitive and collaborative ones. They can train strategic thinking skills, quick decision-making, and improve hand-eye coordination. Online games can also develop social skills such as teamwork, communication, and sportsmanship, especially in games played in groups. Furthermore, online games have also driven the growth of the *Electronic Sports* (E-sports) industry, which is now recognized as a competitive field that requires high skill, discipline, and dedication (Medina, 2024).

Esports is not only a form of entertainment, but also offers opportunities for students to develop talents, creativity, and even professional careers in the digital world. For students who participate in esports activities, online games can be a means of developing interests and talents, increasing self-confidence, and opening up opportunities for non-academic achievements. Some schools have begun integrating esports into

extracurricular activities, through the formation of school-sponsored esports teams and leagues. This way, schools can increase student enthusiasm and interest, as well as their problem-solving skills. By positively everaging students' interest in online games, esports can become a means of self-development and a healthy outlet for competitive energy (Medina, 2024).

The negative impact of online gaming can be addiction if played excessively and for extended periods of time. The *World Health Organization* (WHO) has included online gaming addiction, or gaming disorder, in the latest edition of the *International Statistical Classification of Diseases* (ICD) as a form of mental disorder. In ICD-11, the WHO categorizes this condition as a disorder due to addictive behavior, which is a disorder that arises from addictive behavior. The WHO also explains that one of the characteristics of someone experiencing gaming disorder is the inability and lack of motivation to engage in activities when not playing games (World Health Organization, 2023).

Online gaming addiction is becoming a growing phenomenon due to the rapid growth of visual media use in the digital age. By 2025, the total number of active video game players worldwide is projected to reach 3.32 billion. Other statistics on online gaming addiction indicate that 1–10% of gamers worldwide have a compulsive addiction problem.(D, 2025) Indonesia has a significant and growing number of online gamers. In 2021, Indonesia ranked third in the world for online gaming, with 94.5%, or 263,420,981 internet users, demonstrating that the Indonesian population is an active gamer population. In Indonesia, 77.5% of adolescents aged 15-18 are addicted to online gaming, comprising 887,003 males and 22.5% of females (Leqa, 2024). According to data from the Ministry of Communication and Informatics, the number of gamers in Indonesia reached 121.7 million in 2021 and increased to 174.1 million in 2022. It is estimated that by 2025, the number of gamers will reach 192.1 million across various platforms (Kementerian Komunikasi dan Informatika Republik Indonesia, 2021).

Komisi Perlindungan Anak Indonesia (KPAI) reported that in 2021, more than 71.3% of schoolchildren owned gadgets and used them for extended periods. Approximately 79% of children used their gadgets for non-learning purposes on a daily basis (Komisi Perlindungan Anak Indonesia (KPAI), 2020). According to 2023 data from the *Badan Pusat Statistik* (BPS), the 0–18 age group is the largest user of online games, accounting for 46.2%. The data also shows that one child typically plays more than one online game. This indicates that many children in Indonesia have reached a stage that can be categorized as online game addiction (Leqa, 2024; Sucipto, 2024). Online game

addiction occurs more often in the 10-19 year old age group, because teenagers have a high level of curiosity about new things, so that it influences them and they continue to do it without thinking about what will happen next (Saputra et al., 2023). Teenagers. Who are addicted to playing online games will tend to forget their academic responsibilities, resulting in a decline in academic performance at school (Trisnani & Wardani, 2018). Students who are addicted to online games tend to feel lazy about studying and prefer to spend their time playing online games. Students who spend hours playing games tend to experience decreased focus while studying, are slow in completing assignments, and even have absenteeism. As a result, their academic performance can decline drastically, which also impacts test scores and understanding of the material. Furthermore, online game addiction also affects students' sleep patterns and mental health. Many students stay up late just to play games, resulting in fatigue and drowsiness in class, which leads to a loss of concentration while studying (Rini, 2020).

Academic achievement is the result of a student's academic accomplishments, specifically their academic achievements in class. One indicator for assessing academic achievement is a student's report card grades. These grades are the best indicator for assessing a student's academic achievement throughout school, as they cover all subjects taught in school and are accumulated over the course of a semester (Riadi, 2022). A student's academic performance in school will be good if they can make time for studying. However, students who are addicted to online gaming often prefer to spend their time playing online games rather than studying. This can certainly lower their academic performance in school (Kurniawati & Tambakreja, 2020).

Previous studies have found that addiction to online games (*e-sport games*) has a significant impact on the decline in academic achievement of adolescents in Lhokseumawe City. This study revealed that 68.6% of respondents with high playing intensity had "poor" achievement, while 23.8% of players with low intensity showed better achievement (Azwar, 2020). A study conducted on medical students at the University of Lampung revealed a weak negative correlation between online gaming addiction on smartphones and their academic achievement, indicating that the higher the level of online gaming addiction, the lower their academic achievement. Although the correlation is weak, this finding confirms that online gaming addiction can be a factor contributing to lower academic achievement (Satria et al., 2019). Research on junior high school students also showed a negative relationship between online gaming addiction and academic achievement. This means that the higher the level of online gaming addiction,

the lower the student's academic achievement (Rifqy & Winingsih, 2021). Strengthened by research on elementary school students which also found that online game addiction has a negative impact on elementary school students' academic achievement, where students who frequently play games such as Free Fire and Mobile Legend show a decline in academic grades, difficulty understanding lesson materials, and delays in submitting assignments (Prasetyo et al., 2023).

Researchers conducted initial observations at State Senior High School 4 Tanjung Jabung Timur in July 2025. The observations revealed that the school allows students to bring their mobile phones to school on the condition that they do not use them during class hours. However, an interview with one of the teachers revealed that many students still violate this rule by continuing to use their mobile phones in class, especially for playing online games. In fact, it is not uncommon to find students skipping class and going to the cafeteria just to play games with their friends. The school security guard also noted that the school has attempted to address this problem by imposing punishments, such as exposing students to the sun in the middle of the field. However, this measure apparently did not have a significant deterrent effect. Students continue to repeat the same violations, indicating that conventional disciplinary approaches are not effective enough to change their behavior.

From these initial observations, researchers discovered a phenomenon in the field: many students were addicted to online gaming, evident in their daily gaming sessions, which typically exceeded three hours. Researchers interviewed 10 respondents. The results showed that all respondents were addicted to online gaming, characterized by daily gaming sessions exceeding three hours. Seven of these 10 respondents also reported declining academic performance, as evidenced by a decrease in their average grades on their report cards. Researchers also conducted in-depth interviews with several students. One student, identified as DAS, revealed that he spent most of his time playing online games. Even at home, he never studied or reviewed previously learned material. Over the past few semesters, his grades in several subjects had declined. Furthermore, a student identified as RS revealed that he quickly became bored during class and often opted to skip class and go to the cafeteria, where he played online games with his virtual friends. It was also discovered that the RS ranking dropped when report cards were received, clearly a result of respondents preferring to play online games over participating in classroom learning activities. A student with the initials MS stated that he was more interested in playing online games than studying. He chose to play games because he

wanted to continue honing his gaming skills, driven by his ambition to win online gaming tournaments. This led him to spend more time playing online games than studying, and this lack of study time undoubtedly impacted his academic performance.

SMAN 4 was chosen as the research location because it has characteristics that align with the research focus, particularly in developing students' interests and talents in non-academic areas through e-sports activities. Based on preliminary surveys at several other high schools, it was discovered that most of these schools did not regularly host e-sports activities. Unlike other schools, SMAN 4 has consistently implemented scheduled e-sports activities and regularly held e-sports competitions since 2022, both in the form of internal competitions and participation in tournaments outside of school. Student involvement in these e-sports activities demonstrates a high level of student interest in competitive online gaming. This situation has the potential to lead to addictive behavior that can impact students' academic achievement, making SMAN 4 an appropriate and representative location to study the relationship between online gaming addiction and the academic achievement of students participating in e-sports. Based on the description above and preliminary field observations, it is known that online gaming addiction can impact students' academic achievement at school.

METHOD

This research is a quantitative study using a correlational analytic method with a cross- sectional approach, conducted at SMA Negeri 4 Tanjung Jabung Timur from July 2025 to January 2026. The population consisted of 46 students in grades XI and XII who play online games and have participated in online game tournaments, using total sampling. Data were collected through questionnaires *Game Addiction Scale* (GAS) and students' report cards, with primary data from interviews, surveys, and observations, and secondary data from academic records. Data collection began with obtaining official research permits from the Education Office of Jambi Province, school approval, and ethical clearance from the Universitas Jambi Ethics Committee. The researcher coordinated with the school's Vice Principal for Student Affairs to schedule the study, gathered respondents, explained the research, and obtained informed consent. Questionnaires using the GAS were distributed, and academic achievement data were collected through documentation with school permission. All data were checked, processed, and analyzed using SPSS. Data processing included editing, coding, entry, and cleaning.

After data processing, data analysis was conducted using SPSS software to obtain research conclusions. The analysis included univariate and bivariate tests. The univariate analysis examined each variable separately. Online game addiction was measured using a 21- item questionnaire with a Likert scale. Academic achievement was analyzed based on students' report card grades, using the average score from the last semester. The bivariate analysis was conducted to examine the relationship between online game addiction and academic achievement using the Kendall's Tau statistical test. This test was used to determine whether here was a positive or negative relationship between the level of game addiction and students' academic performance. This study had obtained ethical approval from the Faculty of Medicine and Health Sciences, Universitas Jambi, on December 22, 2025, with approval number 4866/UN21.8/PT.01.04/2025.

RESULTS AND DISCUSSION

Results

Respondent Characteristics

Table 1. Distribution of Respondent Characteristics

Characteristics		Frequency (n)	Percentage (%)
Age (Years)	16 years	10	21.7
	17 years	18	39.1
	18 years	18	39.1
	Total	**46**	**100**
Gender	Male	41	89.1
	Female	5	10.9
	Total	**46**	**100**
Playing Duration	3 hours	6	13.0
	4 hours	7	15.2
	5 hours	10	21.7
	6 hours	10	21.7
	7 hours	5	10.9
	8 hours	2	4.3
	9 hours	2	4.3
	10 hours	4	8.7
	Total	**46**	**100**

Table 1 shows that the majority of respondents were aged 17 and 18, with 18 respondents (39.1% each). Meanwhile, 10 respondents aged 16 (21.7%) were 16 years old. This indicates that the majority of respondents were in the 17–18 age range, which is the late adolescent age group, typically in grades 11–12 of high school. Based on gender, the majority of respondents were male (41 respondents) (89.1%), while 5 were female (10.9%). This data indicates that the respondents in this study were predominantly male. This may indicate that more students participate in or are active in gaming (or e-sports)

activities, such as male than female. Based on the duration of daily gaming, the following were found: 5 hours and 6 hours were the most common, with 10 respondents (21.7%) each. These results indicate that the majority of respondents played games for a relatively long time, averaging 5–6 hours per day. There were even some respondents who played up to 8–10 hours per day, which indicates a high playing intensity.

Univariate Analysis

Table 2. Distribution of Respondents Based on Game Addiction and Academic Achievement

Variable	Category	Frequency (n)	Percentage (%)
Game Addiction	Mild	9	19.6
	Moderate	15	32.6
	Severe	22	47.8
	Total	**46**	**100**
Academic Achievement	Fairly Good	17	37.0
	Good	28	60.9
	Very Good	1	2.2
	Total	**46**	**100**

Based on Table 2, the distribution of respondents based on their level of gaming addiction, of the 46 respondents, the majority were found to be in the severe gaming addiction category, namely 22 (47.8%). This result indicates that nearly half of the respondents had a severe level of gaming addiction. Regarding academic achievement, of the 46 respondents, the majority were found to be in the good academic achievement category, namely 28 (60.9%).

Bivariate Analysis

Table 3. The Relationship Between Online Game Addiction & Students' Academic Achievement

Online Game Addiction	Academic Achievement								Correlation Coefficient	*p-value*
	Good		Enough Good		Very good		Total			
	f	%	f	%	f	%	f	%		
Mild	1	11,1	7	77,8	1	11,1	9	19,6	-0,626	0,000
Moderate	0	0	15	100	0	0	15	32,6		
Severe	16	72,7	6	27,3	0	0	22	47,8		
Total	17	37	28	60,9	1	2,2	46	100		

Based on Table 3, the results of the Kendall's Tau correlation test between online gaming addiction and students' academic achievement, a correlation coefficient (τ) value of - 0.626 was obtained with a significance value (Sig. 2-tailed) of 0.000 and the number of respondents (N) was 46 people. The significance value of 0.000 is smaller than 0.05 ($p < 0.05$), so it can be concluded that there is a significant relationship between online gaming addiction and students' academic achievement. Thus, H0 is rejected and H1 is

accepted. The correlation coefficient value of -0.626 indicates that the direction of the relationship is negative with a strong relationship strength. This negative direction means that the higher the level of online gaming addiction, the lower the students' academic achievement tends to be. Conversely, the lower the level of online gaming addiction, the higher the students' academic achievement tends to be. Thus, it can be concluded that online gaming addiction has a strong and significant relationship with students' academic achievement with the opposite direction of the relationship.

Respondent Characteristics Overview

The respondents in this study were eleventh and twelfth grade students at SMA Negeri 4 Tanjung Jabung Timur who played online games and had participated in e-sports competitions. Based on the results of the analysis of the distribution of respondent characteristics, this study involved 46 students as a sample. In terms of age, the majority of respondents were between the ages of 17 and 18, with 18 respondents (39.1%) and 10 respondents aged 16 (21.7%). This data indicates that the majority of respondents were in their late teens. In this developmental phase, individuals are generally in the stage of searching for identity, have a high level of curiosity, and tend to be more active in social activities and the use of digital technology, including playing online games (Leqa, 2024; Rahman et al., 2022). Late adolescence is also an important period in academic development because students are in grades XI and XII which have greater academic demands, so the intensity of activities outside of learning, such as playing games, has the potential to have an impact on academic achievement (Amril et al., 2022a)

The majority of respondents in this study were male, 41 (89.1%), while only 5 (10.9%) were female. The predominance of male respondents indicates that online gaming and e-sports involvement are more popular among male students than female students. In general, males tend to be more interested in competitive, strategy-based, and challenging games, which are commonly found in online games. This condition may also explain why the majority of the study sample came from male groups. This difference in interests based on gender is important to note because it can influence the intensity of play and the level of game addiction (Lete et al., 2022)**.** The results of the study showed that the majority of respondents played games for 5–6 hours per day (21.7%). In addition, there were respondents who played for 7 hours (10.9%), 8 hours (4.3%), 9 hours (4.3%), and up to 10 hours per day (8.7%). Respondents who played for 3–4 hours per day also showed a significant number. This finding indicates that the majority of respondents had a relatively

high intensity of gaming. Playing duration of more than 4 hours per day can be categorized as intense use, especially if done routinely every day. High gaming intensity has the potential to affect students' time management, especially in dividing time between academic activities and entertainment (Zendrato & Harefa, 2022)

The characteristics of the respondents in this study indicate that the majority were male adolescents aged 17–18 years with an average gaming duration of 5–6 hours per day. This composition provides an important context for understanding levels of gaming addiction and its relationship to academic achievement. Late adolescence is a developmental phase marked by increased identity exploration and use of digital technology, so high-intensity gaming has the potential to impact time management and academic responsibilities (Hikmandayani et al., 2023). The dominance of male respondents with relatively high playing duration also strengthens the relevance of this study in analyzing the relationship between game addiction and academic achievement.

Overview of Online Gaming Addiction

The results of the study on 46 respondents showed that the majority of students were in the category of severe game addiction, namely 22 people (47.8%). Respondents with moderate addiction category numbered 15 people (32.6%), while the mild addiction category was 9 people (19.6%). This distribution shows that more than half of the respondents (80.4%) were in the moderate to severe category, which means that most students have shown symptoms of game addiction at a level that requires attention. Measurement of game addiction in this study used the 21-item Game Addiction Scale (GAS) instrument, which consists of 7 main dimensions of addiction, which include indicators such as salience (games become the most dominant activity in the mind), tolerance (the need to play is increasing), mood modification (playing to change mood), relapse (failure to reduce playing time), withdrawal (feeling restless when not playing), conflict (conflict with the surrounding environment), and problems (the emergence of problems due to playing games (Mujiya Ulkhaq et al., 2018)

The questionnaire results showed that the majority of respondents answered "often" or "very often" for most items. This indicates that addiction symptoms do not only appear in one or two aspects, but are relatively evenly distributed across the various dimensions of addiction. For example, in the salience dimension, respondents' responses tended to be high, with 47.9%, 65.2%, and 56.5% responding frequently to the three items, respectively. This indicates that online gaming has become a fairly dominant activity in

the lives of most respondents. The tolerance dimension showed a high trend, with 54.4%, 54.3%, and 52.2% responding frequently to the three items, respectively. This indicates that more than half of respondents experienced an increased need to play games to achieve desired satisfaction. In the mood modification dimension, respondents answered "often" and "very often" to the three items, respectively, at 65.2%, 73.9%, and 56.5%. This indicates that most respondents use gaming as a means to improve or change their mood.

The questionnaire results for the relapse dimension showed a quite prominent trend, marked by the dominance of the "frequent" category across most indicators (34.8%–45.7%). This indicates respondents' difficulty controlling or stopping gaming and a tendency to return to gaming after attempting to cut back. The withdrawal dimension generally fell at a moderate level, with the "sometimes" category having the highest percentages (32.6% and 39.1%), although in one indicator the "frequent" category reached 39.1%. This finding suggests that some respondents experience discomfort when not playing games, but the intensity is not yet fully dominant across all respondents. In the "conflict" dimension, responses varied. Most respondents stated they never experienced conflict on one indicator (63.0%), but in another indicator the "frequent" category was dominant (39.1%–43.5%). This indicates that conflict resulting from gaming is not experienced evenly, but is quite significant in certain aspects. The "problems" dimension showed a fairly strong trend in several indicators, marked by the dominance of the "very frequent" category at 54.3%. However, in other indicators, the majority of respondents stated they never experienced it (39.1%). This indicates that the problematic impacts of gaming are selective and not experienced by all respondents.

Overall, the results of this study indicate that respondents' tendencies toward online gaming addiction are prominent across all aspects of salience, tolerance, mood modification, relapse, and some indicators of problems, while withdrawal and conflict show more moderate and variable levels. These findings indicate a significant tendency toward addictive behavior, particularly in terms of difficulty controlling online gaming activities. Respondents in the mild addiction category begin to exhibit some symptoms of addiction, but these symptoms have not yet significantly disrupted academic or social functioning. (Fajar et al., 2024) In this category, GAS scores tend to be in the low to medium range (21–49), and the frequency of "often" responses does not yet dominate all dimensions.

A moderate level of addiction is characterized by the presence of fairly consistent symptoms in respondents, with a total score in the mid-range (50–77). At this level,

gaming behavior begins to impact time management, concentration, and academic responsibilities, although it has not yet completely disrupted all aspects of daily life (Fajar et al., 2024). The majority of respondents in this study were at a severe level of addiction, characterized by high GAS scores (78–105) and a predominance of "often" to "very often" responses across most dimensions. This indicates that gaming has become a very dominant activity in the respondents' daily lives. At this level, the majority of respondents experienced significant difficulty controlling their gaming behavior and experienced emotional disturbances when not playing (withdrawal) (Fajar et al., 2024).

These findings align with the characteristics of respondents, who indicated that the majority played games for 5–6 hours per day, sometimes reaching 8–10 hours. This relatively high playing time corroborates the GAS-21 measurement results, which indicate that playing intensity contributes to increasing levels of addiction. Consistently long playing times can increase the likelihood of tolerance and relapse, where respondents need longer playing time to achieve the same level of satisfaction and experience difficulty when trying to reduce playing time (Leqa, 2024). The results of the GAS-21 measurement showed a tendency towards relatively high levels of gaming addiction among respondents, characterized by a predominance of moderate to severe categories and a frequency of "often" and "very often" responses for most items. This pattern indicates that gaming behavior is no longer merely recreational but has evolved into an activity that occupies a significant portion of daily life. This condition has the potential to affect the balance between academic demands and recreational activities, as well as impact psychosocial aspects such as self-control, emotional regulation, and social interaction.

Overview of Academic Achievement of Students Who Participated in E-Sports at SMAN 4 Tanjung Jabung Timur

The results of the study of 46 respondents revealed that the majority of respondents had academic achievement in the good category, namely 28 (60.9%). Furthermore, 17 respondents (37.0%) were in the fair category, while only one (2.2%) was in the very good category. These results indicate that, in general, the respondents' academic achievement was relatively good. The majority of respondents were still able to maintain academic achievement that met school standards. However, the number of respondents who achieved the very good category was still very small, suggesting that although most respondents had good academic performance, not many had achieved optimal or superior achievement. Academic achievement in this study was measured using report card grades

for the last two semesters. Report card grades reflect the results of a comprehensive learning evaluation, encompassing cognitive (knowledge), affective (attitude), and psychomotor (skills) aspects. Therefore, report card grades can be considered a fairly representative indicator of students' overall academic performance.

The distribution of categories showed a predominance of the "good" category, indicating that respondents were still able to carry out their academic responsibilities optimally, despite the large number of respondents having played games for a long time and experiencing significant levels of addiction. This may indicate that some respondents are still able to balance gaming activities with academic obligations. However, the high percentage of respondents in the "fair" category (37.0%) is also a concern. This category indicates that there is a group of respondents experiencing a decline in academic performance, although not yet in the low category. Further analysis linking levels of gaming addiction showed that the majority of respondents with fair academic performance were actually in the heavy gaming addiction category. This finding is important because it suggests a tendency that high levels of gaming addiction can impact academic achievement. Therefore, the "fair" academic performance category of respondents with heavy gaming addiction is likely not due to low intellectual ability, but rather to time management and activity prioritization factors. High-intensity gaming can reduce effective study time, affect concentration, time management, and learning motivation, resulting in suboptimal academic achievement and only being in the good category, rather than good or very good (Susanti et al., 2023)

The low number of respondents in the "very good" category (2.2%) may also indicate that only a small number of respondents were able to achieve optimal academic performance despite the high intensity of gaming activity. This condition suggests that although most respondents are still in the good category, the potential for achieving higher achievement may be hampered by certain factors, including spending a significant amount of time playing games (Amril et al., 2022). The data analysis results show that most respondents have good academic achievement. However, the relatively large proportion of those in the fair category and the low percentage of those in the very good category indicate variations in academic achievement among respondents. This distribution indicates that although the majority of students are still able to maintain adequate academic performance, there is a downward trend in some respondents. This condition is relevant for further analysis in relation to the level of gaming addiction, especially since the results of previous statistical tests showed a significant and negative relationship

between gaming addiction and academic achievement. This negative relationship suggests that increasing levels of addiction tend to be followed by a decline in academic achievement.

The Relationship Between Online Game Addiction and Academic Achievement of Students Participating in E-Sports at SMAN 4 Tanjung Timur

The Kendall's Tau correlation test between online gaming addiction and student academic achievement yielded a correlation coefficient (τ) of -0.626 with a significance value (Sig. 2-tailed) of 0.000 ($p < 0.05$). These results indicate a significant relationship between online gaming addiction and student academic achievement. A significance value less than 0.05 indicates that the relationship between the two variables is not random, therefore, the alternative hypothesis (H1) is accepted and the null hypothesis (H0) is rejected. Therefore, it can be concluded that online gaming addiction has a statistically significant relationship with student academic achievement.

The correlation coefficient of -0.626 indicates a negative relationship with a strong relationship strength. A negative direction means that the higher the level of online gaming addiction, the lower the student's academic achievement. Conversely, the lower the level of gaming addiction, the better the student's academic achievement tends to be. This finding aligns with the results of the previous descriptive analysis, which showed that most respondents with fairly good academic achievement experienced severe gaming addiction. This indicates that high-intensity gaming has the potential to reduce study time, decrease concentration, and disrupt respondents' time management. These conditions can impact academic achievement 49. Theoretically, online gaming addiction can affect students' cognitive function and self- regulation. Students who are addicted tend to prioritize gaming activities over academic obligations. Furthermore, prolonged gaming can lead to physical and mental fatigue, resulting in a less than optimal ability to absorb and process learning materials. Disrupted sleep patterns due to late-night gaming can also contribute to decreased concentration in school (Susanti et al., 2023) However, not all students with gaming addiction exhibited significantly low academic achievement. This suggests that other factors also influence academic achievement. However, based on the relatively strong correlation (-0.626), it can be concluded that gaming addiction is a factor that significantly contributes to the variation in academic achievement among respondents in this study.

These findings align with several previous studies showing a link between online gaming addiction and academic achievement. For example, a study measuring online gaming addiction levels and academic achievement of high school students found that the majority of students were moderately addicted and their academic achievement was also moderate. These results also indicate a link between gaming involvement and students' overall academic achievement 50 Similar research also shows that online gaming addiction has a significant negative impact on students' academic achievement through decreased concentration as an intervening variable. In other words, gaming addiction is not only correlated with decreased academic achievement but also through impaired concentration and time management, which impacts students' academic achievement (Cahyani & Friyatmi, 2025)

Correlation analysis revealed a strong and significant negative relationship between online gaming addiction and student academic achievement. This finding indicates that increasing levels of addiction tend to be followed by declining academic achievement. This relationship demonstrates that uncontrolled gaming intensity and patterns have the potential to disrupt students' study time allocation, concentration, and engagement in academic activities. Therefore, the results of this study have practical implications for schools and parents to monitor and support online gaming use to prevent broader impacts on students' academic development.

CONCLUSION

Based on the research results, it can be concluded that respondents were predominantly aged 17–18 years (39.1% each) with the majority being male (89.1%) and the highest playing duration being 5–6 hours per day (21.7% each). The level of online game addiction was in the severe (47.8%), moderate (32.6%), and mild (19.6%) categories, while academic achievement was mostly in the good (60.9%), quite good (37.0%), and very good (2.2%) categories. The results of the Kendall's Tau test showed a strong and significant negative relationship between online game addiction and academic achievement ($\tau = -0.626$; $p = 0.000 < 0.05$), which means that the higher the level of addiction, the lower the student's academic achievement.

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