

## The Relationship Between Online Game Addiction and Cognitive Function Among Students in the E-Sport Student Activity Unit at Jambi University

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### Abstract

Excessive online gaming negatively impacts individuals, especially in academic settings, by reducing motivation, commitment, and cognitive functions critical for success. This study explores the correlation between online game addiction and cognitive function among members of the E-Sports Student Activity Unit at Universitas Jambi. A quantitative correlational design was applied with 66 participants selected by proportionate stratified random sampling. Online game addiction and cognitive function were assessed using the GASA and MoCA-Ina instruments, respectively. Results showed that 37.9% of respondents had moderate addiction levels, while 65.2% maintained normal cognitive function. Spearman rho test revealed a significant negative correlation ( $r = 0.784$ ,  $p < 0.05$ ), indicating that higher addiction levels were associated with lower cognitive function. The findings suggest the need for educational and counseling interventions to promote balanced gaming and academic performance.

**Keywords:** Cognitive Function; Online Game Addiction; University Students

### Introduction

The era of globalization has significantly influenced society, particularly through advancements in education and technology, with the internet as a prime example<sup>1</sup>. The internet is a vast network of interconnected computers that provides unlimited access to information and entertainment applications such as online games<sup>2</sup>. Online gaming evolved from video games played on consoles or servers, serving as a popular recreational activity<sup>3</sup>.

Indonesia ranks fourth globally among smartphone users, with 68% penetration, and is the third-largest country in terms of online gamers. As reported by We Are Social, 94.5% of Indonesian internet users aged 16–64 engage in gaming as of January 2024. However, excessive access to online games leads to problematic behaviors, including addiction, where individuals become excessively dependent on gaming with harmful personal effects<sup>5</sup>.

Addiction to online games is categorized into mild, moderate, and severe, based on the hours spent and behavioral characteristics. Mild addiction involves less than 10 hours monthly with no dependency, moderate addiction spans 10–40 hours with increasing

dependency, and severe addiction consists of gaming over 8 hours daily, often disrupting daily activities and sleep patterns<sup>6</sup>. Excessive online gaming negatively impacts individuals, especially in academic settings, by reducing motivation, commitment, and cognitive functions critical for success<sup>7</sup>. Cognitive function, encompassing attention, memory, perception, and problem-solving, is essential for learning and decision-making. Disruption in these functions impairs academic performance and daily problem-solving abilities<sup>8</sup>.

Research presents mixed views on online gaming's effect on cognition. Some suggest cognitive benefits such as enhanced problem-solving skills and eye-hand coordination from strategic games, while others report declines in attention, impulse control, and memory due to excessive gaming, often linked to addiction. Sleep disturbances from prolonged gaming further impair cognitive abilities<sup>9</sup>. Public concerns also focus on gaming's impact on students' memory and academic performance. Although studies show that gaming addiction correlates negatively with cognitive function and academic success, the exact effects on memory remain debated<sup>10</sup>. Positive impacts exist, such as games like Mobile Legends promoting strategic thinking, creativity, communication skills, and technology use Rani<sup>11</sup>, but negative consequences include neglect of real-life responsibilities and social disconnection<sup>12</sup>.

During interviews conducted on December 15, 2023, with 10 members of the E-Sport Student Activity Unit at Jambi University, most participants acknowledged the negative impact of gaming on their academic activities. They revealed that high gaming intensity made it difficult for them to manage study time effectively. Additionally, they experienced decreased focus during lectures and a tendency to procrastinate on academic assignments. Some also mentioned that playing games late into the night disrupted their sleep patterns.

The purpose of this study is to determine the relationship between online game addiction and cognitive function in students at the E-Sport UKM, Jambi University.

## **Methods**

This study used a quantitative correlational design to examine the relationship between online game addiction and cognitive function among university students. The population included 150 E-Sport Unit members at Universitas Jambi, with 66 respondents

sampled via proportionate stratified random sampling. The instruments applied were the Game Addiction Scale for Adolescents (GASA) and the Indonesian version of the Montreal Cognitive Assessment (MoCA-Ina) to measure addiction levels and cognitive function. Data analysis employed the Spearman rho correlation test. Validity and reliability tests showed strong results: GASA had a Cronbach's alpha of 0.895, and MoCA-Ina had a reliability coefficient of  $r = 0.963$  ( $p = 0.000$ ). Ethical approval was granted by the Universitas Jambi Ethics Committee under reference number 1148/UN21.8/PT.01.04/2024.

## Results

### Univariate Analysis

Table 1 Distribution of Respondent Frequency Based on Level of Online Game Addiction

Addiction Rate of Online Gaming	Frequency	Percentage
Low	20	30,3
Medium	25	37,9
High	21	31,8
<b>Total</b>	<b>66</b>	<b>100</b>

Based on table 1 above, the majority of respondents have a level of addiction to playing online games in the medium category, with a total of 25 (37.9%) respondents. Respondents with low levels of addiction amounted to 20 (30.3%) respondents, while respondents with high levels of addiction amounted to 21 (31.8%) respondents.

Table 2. Distribution of Respondent Frequencies Based on Cognitive Function

Cognitive Function	Frequency	Persentase (%)
Cognitive Impairment	23	34,8
Normal	43	65,2
<b>Total</b>	<b>66</b>	<b>100</b>

Based on table 2 above, most of the respondents have cognitive function in the normal category, namely with a total of 43 (65.2%) respondents, while respondents with cognitive impairments amount to 23 (34.8%) respondents.

Table 3. Correlation of the Relationship of Online Game Addiction to Cognitive Function in Students at E-Sports UKM University of Jambi.

Addiction Rate of Online Gaming	Cognitive Function						<i>r</i>	<i>p-value</i>
	Normal		Cognitive Impairment		Total			
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%		
<b>Low</b>	20	30,30	0	0	20	30,30	0,784**	0,000
<b>Medium</b>	23	34,85	2	3	25	37,88		
<b>High</b>	0	0	21	31,8	21	31,82		
<b>Total</b>	<b>43</b>	<b>65</b>	<b>23</b>	<b>35</b>	<b>66</b>	<b>100</b>		

Based on table 3, a *p-value* of  $0.000 < 0.05$  is obtained, then it has a meaning between two variables which means that  $H_1$  is accepted and  $H_0$  is rejected. This shows that there is a significant relationship between addiction to playing online games and cognitive function in students who participate in UKM E-Sport. This relationship is shown from the results of the *r-value* of 0.784 with a strong correlation level where the coefficient interval is between 0.60 - 0.799.

## Discussion

The results of the study indicate a significant relationship between online game addiction and cognitive function, with a significance value of 0.000, which is less than 0.05. This finding is consistent with previous research conducted by Andriyanto concerning the relationship between online game addiction and cognitive function in students, which was evidenced by academic performance, showing a correlation analysis result with a *p-value* of less than 0.05 and a negative direction of correlation<sup>13</sup>.

Late adolescence is a critical developmental phase vulnerable to various changes, including tendencies toward addiction. One common form of addiction during this period is online gaming, which is a primary factor influencing adolescents' cognitive function<sup>14</sup>. Online game addiction, especially at moderate levels, shows a significant relationship with overall cognitive function, affecting both its positive and negative aspects. However, when engaged in a balanced and controlled manner, online gaming can positively contribute to enhancing adolescents' cognitive functions optimally, such as critical thinking, problem-solving, and decision-making abilities<sup>15</sup>.

This finding indicates that although many respondents exhibit moderate tendencies in online gaming, it has not yet significantly impacted their cognitive abilities negatively. However, continuous attention and monitoring are necessary to prevent addiction levels

from increasing, which could potentially disrupt cognitive function in the future. The current research aligns with the study by Utami, which demonstrated a significant correlation of 0.752 between gaming duration and cognitive abilities in students<sup>16</sup>. Similarly, Rahayu's study reported a positive relationship between online game addiction and the decline of certain cognitive functions among students, with a correlation coefficient of 0.765<sup>17</sup>.

## Conclusion

The majority of respondents exhibited a moderate level of online game addiction (37.9%) and maintained normal cognitive function (65.2%). There is a significant relationship between online game addiction and cognitive function among students. Specifically, as the level of addiction increases, cognitive function tends to decrease.

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