EXAMINING THE COMBINED INFLUENCE OF ONLINE GAMING HABITS AND SLEEP DISTURBANCES ON LEARNING MOTIVATION: EVIDENCE FROM INDONESIAN UNDERGRADUATE STUDENTS

Pande Ryan Praba Wangsa [1];, B. Primandini Yunanda Harumi [1]*
[1] Universitas Udayana, Bali, Indonesia
* Correspondence Author: panderyan2311@student.unud.ac.id

Abstract :
Motivation to learn is a crucial factor in shaping students' academic achievement. However, dependence on a digital lifestyle, including online games, can disrupt students' sleep quality and focus on learning. This study aimed to examine the effects of online gaming intensity and sleep quality on students' learning motivation. A quantitative approach was employed using multiple linear regression analysis, involving 110 active undergraduate students from the Faculty of Medicine, Udayana University. The results showed a significance value of 0.000 ($p < 0.05$) with a coefficient of determination (R^2) of 0.804. This indicates that online gaming intensity and sleep quality together significantly influence learning motivation, accounting for 80.4% of the variance. The standardized beta coefficient for online gaming intensity was -0.757 ($p = 0.000$), indicating a strong negative effect on learning motivation. Similarly, the standardized beta coefficient for sleep quality was -0.191 ($p = 0.001$), indicating a significant negative impact as well. In conclusion, lower online gaming intensity and better sleep quality are associated with higher learning motivation among students.

Keywords :
Learning Motivation; Online Gaming; Sleep Quality.

Abstrak :
Motivasi belajar menjadi salah satu faktor krusial dalam membentuk prestasi akademik siswa. Akan tetapi, ketergantungan terhadap gaya hidup digital termasuk game online dapat menjadi faktor pengganggu kualitas tidur dan fokus belajar siswa. Penelitian ini bertujuan untuk mengetahui peran intensitas bermain game online dan kualitas tidur terhadap motivasi belajar mahasiswa Fakultas Kedokteran Universitas Udayana. Penelitian ini menggunakan pendekatan kuantitatif dengan teknik analisis regresi linear berganda, melibatkan 110 mahasiswa aktif Fakultas Kedokteran Universitas Udayana sebagai responden. Hasil uji regresi berganda menunjukkan nilai signifikasi 0,000 (p < 0,05) dengan koefisien determinasi sebesar 0,804. Hal ini menunjukkan bahwa intensitas bermain game online dan kualitas tidur secara simultan berperan signifikan sebesar 80,4% terhadap motivasi belajar. Koefisien beta terstandarisasi intensitas bermain game online sebesar -0,757 dan nilai signifikansi 0,000 (p<0,05) menunjukkan intensitas bermain game online berperan secara signifikan terhadap motivasi belajar. Koefisien beta terstandarisasi kualitas tidur sebesar -0,191 dan nilai signifikansi 0,001 (p<0,05) menunjukkan kualitas tidur berperan secara signifikan terhadap motivasi belajar. Simpulan dari penelitian ini adalah bahwa semakin rendah intensitas bermain game online dan semakin baik kualitas tidur, maka motivasi belajar mahasiswa semakin tinggi.

Kata Kunci :
Motivasi Belajar; Game Online; Kualitas Tidur.

INTRODUCTION

The According to a news report published on the *Harian Singgalang* website (2020), nearly 60% of university students were reportedly unprepared to engage effectively in face-to-face lectures. This was reflected in their inability to present assignments, citing reasons such as a lack of references, reluctance to attend classes, inattentiveness during lectures, lateness, failure to submit assignments, and even academic dishonesty during exams (Ratinho & Martins, 2023). Students were observed reading from books, copying notes, or cheating, resulting in uniform answers that resembled textbook content (Ratinho et al., 2026). These patterns of behavior often drew negative feedback from lecturers, expressing disappointment in their students. Such observations suggest that these students may have low learning motivation (Campillo-Ferrer et al., 2020; Khaldi et al., 2023). Uno (2018) defines motivation as an internal or external drive that prompts individuals to act (Rackley, 2021; Zou et al., 2024a, 2024b). Motivation and learning are closely interrelated, as each influences the other. Learning itself is a relatively permanent change in behavior resulting from practice or reinforced experience and is driven by a specific goal (Mtebe & Raphael, 2013; Umar, 2023).

The Faculty of Medicine at Udayana University (FK UNUD) is the first medical faculty established in Bali, founded on August 9, 1962. Initially offering only a general medical program, FK UNUD has expanded to include 6 undergraduate programs, 4 professional programs, 20 residency programs, 3 master's programs, and 1 doctoral program. Most programs have received "Excellent" or "Good" accreditation. FK UNUD conducts various academic and non-academic activities to support student learning, development, and community engagement. Students participate in lectures, practicums, research, seminars, workshops, and community service, and are also required to join non-academic activities to earn SKP credits, such as through organizations, sports, arts and culture, religious events, and social activities. Despite FK UNUD's various efforts to support academic and non-academic development, it is important to understand the learning motivation of its students and the efforts they make to improve it.

A preliminary study conducted in July to August 2024 involving 21 FK UNUD students showed that 33.3% reported having low learning motivation. Students with low motivation commonly felt that their study efforts were not proportional to the outcomes they achieved, experienced both academic and non-academic pressures, and reported mental fatigue. The symptoms described included a lack of enthusiasm for studying, difficulties concentrating, and tendencies toward procrastination (Mellasanti Ayuwardani et al., 2024; Ryan & Deci, 2000). Contributing factors identified by the students included

monotonous learning environments, personal problems, academic demands, and interpersonal issues (Mundiri et al., 2022; Rozi & Kamalia, 2023; Sun et al., 2024). Students also reported using various strategies to increase learning motivation, such as playing online games, sleeping, listening to music, and taking personal time. The most frequently chosen strategies were playing online games (28.6%) and sleeping (33.3%). These findings do not indicate a quantitative relationship between online gaming intensity, sleep quality, and learning motivation. However, they provide initial descriptive indications that these activities are commonly used by students when experiencing a decline in motivation. These indications formed the basis for further empirical examination of the relationships among online gaming intensity, sleep quality, and learning motivation in the main study.

A study by Hasan et al. (2023) found that most students perceived online gaming as having a positive effect on learning motivation, although some experienced reduced focus and study time. Many respondents had set time limits for gaming and felt capable of balancing study and play. Nevertheless, some still struggled with maintaining concentration during study sessions. Fresdina and Kuntari (2023) argued that games involving strategic elements could have positive effects, such as enhancing cognitive skills, strategic thinking, and creativity. However, online games also had negative effects, including neglect of homework and reduced learning motivation. These findings are supported by Putra et al. (2019), who noted that online games could build social relationships, serve as a form of relaxation, and foster discipline, communication, teamwork, and English language skills. On the other hand, they also found negative impacts such as increased laziness, time wastage, neglected responsibilities, and potential for addiction.

In addition to online gaming, sleep is also associated with learning motivation. Potter and Perry (2015) explain that sleep is a recurring state involving changes in the level of consciousness, and that good sleep quality is essential for health and recovery. Maisa et al. (2021) add that poor sleep, whether in terms of duration or quality, can negatively affect well-being. Fenny and Supriatmo (2016) describe sleep quality as a condition that allows individuals to feel refreshed and energized upon awakening. Perumal et al. (2016) further state that sleep quality encompasses various quantitative aspects of sleep, such as sleep latency, sleep efficiency, and sleep fragmentation, as well as more subjective aspects, such as the depth or tranquility of sleep. Nugroho and Harahap (2024) found that better sleep quality is associated with higher learning motivation, whereas poorer sleep quality is linked to decreased motivation.

Learning motivation is an important factor that supports students in achieving academic success and completing their studies on time (Muali et al., 2023; Ratinho &

Martins, 2023). Low motivation can lead to various behavioral and performance issues, including avoidance of learning activities, procrastination, reduced concentration, and declining academic engagement (Mundiri & Sholehah, 2020). Online gaming intensity and sleep quality are suspected to be related to the learning motivation of students, particularly those at the Faculty of Medicine of Udayana University, who face high academic demands (Duterte, 2024; Fitriyah Amaliyah, 2024; Li et al., 2024). Based on these considerations, this study is needed to understand the role of both variables in predicting students' levels of learning motivation. Research that examines these two variables simultaneously within a single model remains limited, leaving the joint contribution of online gaming intensity and sleep quality to learning motivation insufficiently understood. Moreover, studies on these variables among medical students are still scarce, even though this group faces heavier academic workloads, higher demands, and a greater risk of sleep disturbances compared to the general student population. These conditions make medical students a particularly relevant population for more in-depth investigation. A clear research gap therefore exists. This study seeks to address that gap by analyzing the simultaneous and partial contributions of online gaming intensity and sleep quality to students' learning motivation.

METHOD

This study employed a quantitative correlational design using multiple linear regression analysis. Data were collected online through a digital questionnaire distributed to active students of the Faculty of Medicine, Udayana University. The total population consists of all active students enrolled in the faculty; however, the specific population of students who play online games is unknown because no institutional records or formal documentation exist regarding the number of medical students who engage in online gaming. For this reason, a non-probability snowball sampling technique was used to recruit participants. The inclusion criteria were active students of the Faculty of Medicine at Udayana University, having played online games within the past month, and willingness to participate in the study. Based on Field's (2009) guideline using the formula 104 + number of predictor variables, the minimum required sample size for this study was 106 participants. The final number of respondents exceeded this minimum requirement.

Data were collected using a Google Form questionnaire consisting of the Learning Motivation Scale, the Online Gaming Intensity Scale, and the Pittsburgh Sleep Quality Index (PSQI). The Learning Motivation Scale was developed based on Uno (2018) theory of learning motivation, which includes intrinsic and extrinsic motivation aspects. The Online Gaming Intensity Scale was constructed based on Horrigan (2002) framework, which consists of two dimensions: frequency and duration of gameplay. Sleep quality was assessed using the Pittsburgh Sleep Quality Index (PSQI) Indonesia version instrument.

Data were analyzed using multiple linear regression with the assistance of the Statistical Package for the Social Sciences (SPSS) version 26.0. Prior to conducting the multiple linear regression analysis, the required regression assumptions were tested. The normality of residuals was assessed using the Kolmogorov–Smirnov test, the linearity of the relationships between variables was examined using scatterplot inspection, and multicollinearity was evaluated by reviewing the tolerance values. All assumptions met the acceptable criteria, allowing the regression analysis to proceed.

Multiple linear regression was then employed to assess the extent to which online gaming intensity and sleep quality contribute to the prediction of students' learning motivation. The decision-making process was based on the significance value. If the significance value was less than 0.05, the predictor variables were considered to have a statistically significant contribution to learning motivation. Conversely, if the significance value exceeded 0.05, the variables were considered to have no statistically significant contribution.

RESULT AND DISCUSSION

The results section of this study presents a comprehensive analysis of the data collected from 110 participants, aged 18 to 23 years, enrolled in various study programs, and representing cohorts from 2021 to 2024. The data gathered includes information on learning motivation, online gaming intensity, and sleep quality, which are the key variables in this research. Descriptive statistics reveal that a majority of the participants exhibit high levels of motivation, with a notable number also showing varying degrees of online gaming intensity and sleep quality. To examine the relationships between these variables, multiple linear regression analysis was employed. The following results section outlines the statistical findings, including the significance of the regression model, the contribution of each independent variable (online gaming intensity and sleep quality), and the impact of these factors on students' learning motivation. The results indicate significant effects, providing insight into the complex dynamics between these variables and their role in influencing learning motivation.

1. **Descriptive Statistic Results**

    Based on the collected data, the total number of subjects in this study was 110 individuals. The participants ranged in age from 18 to 23 years, came from six different study programs, and represented cohorts from 2021 to 2024. The characteristics of the research subjects are presented in Table 1.

Table 1: Descriptive Statictic Data

Category	Description	Frequency	Percentage
Age	18 years	3	2.7%
	19 years	22	20%
	20 years	34	30.9%
	21 years	28	25.5%
	22 years	22	20%
	23 years	1	0.9%
Study Program	Medicine	11	10%
	Psychology	21	19.1%
	Nursing	12	10.9%
	Public Health	22	20%
	Dentistry	10	9.1%
	Physiotherapy	34	30.9%
Cohort	2021	33	30%
	2022	35	31.8%
	2023	28	25.5%
	2024	14	12.7%

Based on the categorization of learning motivation, the majority of participants had a very high level of learning motivation, with 39 individuals (35.5%). A total of 31 participants (28.2%) showed a high level of motivation, while 8 participants (7.3%) demonstrated a moderate level. There were 6 participants (5.4%) who showed a low level of learning motivation, and 26 participants (23.6%) had a very low level of motivation. The distribution of learning motivation levels is presented in Table 2.

Table 2: Categorization of Learning Motivation

Score Range	Category	Frequency	Percentage
$X < 63$	Very Low	26	23.6%
$63 \leq X \leq 81$	Low	6	5.4%
$81 < X \leq 99$	Moderate	8	7.3%
$99 < X \leq 117$	High	31	28.2%
> 117	Very High	39	35.5%
Total		110	100%

Based on the results of the categorization of online gaming intensity, the majority of participants had a low level of gaming intensity. Participants with very high online gaming intensity totaled 25 individuals (22.7%), followed by 10 individuals (9.1%) with high intensity, 14 individuals (12.7%) with moderate intensity, 41 individuals (37.3%) with low intensity, and 20 individuals (18.2%) with very low intensity. The categorization of participants' online gaming intensity is presented in Table 3.

Table 3: Categorization of Online Gaming Intensity

Score Range	Category	Frequency	Percentage
$X < 66$	Very Low	20	18.2%

66 ≤ X ≤ 85	Low	41	37.3%
85 < X ≤ 104	Moderate	14	12.7%
104 < X ≤ 123	High	10	9.1%
> 123	Very High	25	22.7%
Total		110	100%

Based on the sleep quality categorization, the majority of participants had good sleep quality. A total of 74 participants (67.3%) were categorized as having good sleep quality, while 36 participants (32.7%) were categorized as having poor sleep quality. The sleep quality categorization is shown in Table 4.

Table 4: Categorization of Sleep Quality

Score Range	Category	Frequency	Percentage
X ≤ 5	Good	74	67.3%
X > 5	Poor	36	32.7%
Total		110	100%

2. Hypothesis Testing Results

This study employed multiple linear regression analysis to test the hypothesis regarding the impact of online gaming intensity and sleep quality on learning motivation. The analysis revealed an F-value of 220.145 with a significance level of 0.000 ($p < 0.05$), indicating that both online gaming intensity and sleep quality have a significant effect on learning motivation. The high F-value demonstrates that the regression model used can explain a significant portion of the variance in learning motivation, providing strong evidence that online gaming intensity and sleep quality jointly play a crucial role in determining students' learning motivation. The detailed results of the hypothesis test are presented in Table 5.

Table 5: Hypothesis Test Results (Anova)

	Sum of Square	df	Mean Square	F	Sig.
Regression	78688.481	2	39344.240	220.145	.000
Residual	19122.974	107	178.719		
Total	97811.455	109			

The correlation coefficient (R) value of 0.897 and the coefficient of determination (R^2) value of 0.804 indicate a strong relationship between the independent variables (online gaming intensity and sleep quality) and learning motivation. Specifically, the R^2 value of 0.804 means that approximately 80.4% of the variance in learning motivation can be explained by these two variables, while the remaining 19.6% is due to other factors not analyzed in this study. This result emphasizes the significant contribution of the factors tested in this research toward explaining changes in students' learning

motivation. Further details regarding the effectiveness of the regression model are presented in Table 6.

Table 6: Regression Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate
.897	.804	.801	13.369

Additionally, the regression analysis provided data on the individual effects of each independent variable. The online gaming intensity variable had a t-value of -13.126 with a significance level of 0.000 ($p < 0.05$), indicating that online gaming intensity has a significant effect on students' learning motivation. Specifically, the negative coefficient for online gaming intensity shows that as the intensity of online gaming increases, students' learning motivation decreases. On the other hand, the sleep quality variable also significantly affected learning motivation with a t-value of -3.317 and a significance level of 0.001 ($p < 0.05$). This suggests that poor sleep quality is associated with lower learning motivation. Detailed results of each predictor's contribution are displayed in Table 7.

Table 7: Coefficients of Regression Model

Variabel	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
Constant	176.216	4.343		40.577	.000
X1					
	-.761	.058	-.757	-13.126	.000
X2	-.905	.574	-.191	-3.317	.001

These results support the hypothesis that both online gaming intensity and sleep quality significantly impact learning motivation. In this context, online gaming intensity appears to have a stronger negative effect on learning motivation compared to sleep quality. Thus, these findings confirm the importance of maintaining a balance between online gaming activity and sleep quality for enhancing students' learning motivation.

The results of this study indicate that the intensity of online gaming and sleep quality have a significant effect on the learning motivation of students at the Faculty of Medicine, Udayana University. This is evidenced by the results of the multiple linear regression test, which showed a significance value of 0.000 ($p < 0.05$) and an F-value of 220.145. These findings demonstrate that, simultaneously, both independent variables exert a significant influence on students' learning motivation. The coefficient of determination (R^2) was 0.804, indicating that 80.4% of the variation in learning motivation can be explained by the

intensity of online gaming and sleep quality, while the remaining 19.6% is attributed to other factors not examined in this study.

Research by Lagili et al. (2019) found that technology (such as gaming, internet use, and social media) and physiological needs (such as sleep, food, and shelter) are among the factors that can influence students' learning motivation. This was evident in students' lack of focus during lessons and a tendency to complete assignments at the last minute, often relying on peers or the internet. Furthermore, research by Husniah et al. (2025) revealed a significant relationship between the intensity of online gaming and the level of learning motivation. Specifically, as the intensity of online gaming increases, learning motivation tends to decrease, and vice versa. In addition, Sugiarti et al. (2025) found a significant relationship between sleep quality and students' learning motivation. Students with irregular sleep patterns and insufficient sleep duration showed decreased memory and concentration, resulting in low learning motivation during class. Sleep allows the brain to rest, and a decline in classroom concentration is often caused by drowsiness and fatigue, both of which negatively impact learning motivation. Therefore, both online gaming intensity and sleep quality can simultaneously influence students' learning motivation.

Descriptive data showed that the majority of respondents had very high (35.5%) and high (28.2%) levels of learning motivation. However, the proportion of students with very low motivation (23.6%) signals the need for greater attention to factors influencing learning enthusiasm, including online gaming intensity and sleep quality. Most participants had low online gaming intensity, with 41 students (37.3%) categorized in this group. Low gaming intensity reflects shorter playing frequency and duration, which tends to have a positive impact on individuals. Hasan et al. (2023) found that most students felt online games positively influenced their learning motivation, although excessive play could lead to focus disturbances. Putra et al. (2019) also stated that online gaming can foster social connections, reduce stress, and improve discipline, communication, collaboration, and English language skills.

The majority of participants had good sleep quality, with 74 students (67.3%) reporting such, while 36 students (32.7%) had poor sleep quality. Good sleep quality is characterized by minimal disturbances such as waking at night, the need to urinate, feeling too hot or cold, snoring, or taking sleep medication. According to Potter & Perry (2015), good sleep quality offers several benefits, including improved physical vitality, better memory access, and enhanced concentration. Research by Gustiawati & Murwani (2020) also showed that sleep deprivation can reduce concentration during learning due to the body not having sufficient time to recover organ functions after a day's activity.

Partially, online gaming intensity showed a significance value of 0.000 ($p < 0.05$) with a negative coefficient, indicating that higher online gaming intensity is associated with lower student learning motivation. Research by Amalia (2022) found a negative correlation between online gaming intensity and learning motivation, where increased playing time led

to lower motivation. Similar findings were reported by Alfiani et al. (2023), who noted that individuals who spend excessive time playing online games tend to have lower learning motivation and academic achievement. Hasan et al. (2023) added that while the effects of online gaming vary, high playing intensity tends to divert focus from learning, reduce task commitment, and increase laziness.

Meanwhile, sleep quality also showed a significant effect on learning motivation, with a significance value of 0.001 (p < 0.05). The negative coefficient indicates that more frequent sleep disturbances (poor sleep quality) are associated with lower learning motivation. Research by Sutarti et al. (2018) confirmed a significant relationship between sleep quality and learning motivation; the better the sleep quality, the higher the learning motivation. Improving sleep quality is recommended to increase low learning motivation and maintain high motivation to support academic achievement. Sukamto et al. (2024) added that most students with poor sleep quality tend to engage in unhealthy habits, such as staying up late, using mobile phones, watching movies, or going out at night. These behaviors are common among adolescents and young adults. Tight class schedules and heavy academic workloads often cause students to neglect rest, which, combined with stress and an unsupportive dormitory environment, impacts classroom concentration. Based on the above explanation, it can be concluded that the intensity of online gaming and sleep quality simultaneously have a significant effect on the learning motivation of students at the Faculty of Medicine, Udayana University. Additionally, both online gaming intensity and sleep quality individually influence the learning motivation of these students. Therefore, controlling online gaming intensity and maintaining good sleep quality are essential for improving learning motivation.

The results of this study demonstrate that both the intensity of online gaming and sleep quality significantly influence learning motivation among students at the Faculty of Medicine, Udayana University. Multiple linear regression analysis indicated a significant effect of both independent variables on learning motivation, with a significance value of 0.000 (p < 0.05) and an F-value of 220.145. The regression model explained 80.4% of the variance in learning motivation, highlighting that a significant portion of academic motivation variance can be attributed to online gaming intensity and sleep quality, while the remaining 19.6% is influenced by other factors not examined in this study. These findings align with evidence in the literature that suggests a link between video game use, sleep disturbances, and psychological outcomes that may affect academic motivation (Altintas, Karaca, Hullaert, & Tassi, 2019).

From a theoretical perspective, this study contributes to the understanding of how behavioral and physiological variables intersect with academic motivation. Previous research has established that excessive gaming and poor sleep quality can lead to fatigue, decreased alertness, and cognitive impairments, which ultimately affect academic engagement (Abdalla et al., 2024). This study supports the tenets of Self-Determination Theory, which posits that intrinsic motivation is influenced by environmental factors that

fulfill basic psychological needs, such as autonomy, competence, and relatedness (Deci & Ryan, 1985; Gagné & Deci, 2005; Ryan & Deci, 2020). The findings suggest that both online gaming intensity and sleep quality impact students' intrinsic motivation, influencing their learning outcomes. These results contribute to a broader understanding of how non-academic factors, such as gaming and sleep, can affect academic performance.

The practical implications of this research are substantial for educators and university administrators. Given the negative correlation between online gaming intensity and learning motivation, interventions that help students manage their gaming habits could positively impact their academic outcomes. Universities might consider incorporating digital literacy programs to raise awareness of the effects of excessive gaming on sleep and academic performance. Additionally, improving sleep quality is crucial, as it directly affects motivation and cognitive function. Universities could implement sleep education campaigns or counseling services to help students develop healthier sleep habits. These practical interventions would not only enhance students' learning motivation but also improve their overall well-being and academic success.

However, there are limitations to this study that should be addressed in future research. First, the cross-sectional design limits the ability to establish causal relationships between the variables. Longitudinal studies would allow researchers to track changes in gaming intensity and sleep quality over time to better understand their long-term effects on learning motivation. Second, the use of self-reported data introduces the possibility of bias, as students may not accurately report their gaming habits or sleep patterns. Future research should employ objective measures, such as digital tracking devices for gaming and sleep monitoring, to complement self-reported data and enhance accuracy. Third, the study sample was limited to students from a single faculty at one university, which may limit the generalizability of the findings. Future research should include students from multiple disciplines and universities to assess the broader applicability of these results.

Future research should explore additional factors that may mediate or moderate the relationships observed in this study. For example, it would be useful to investigate how academic stress, personality traits, and social support interact with gaming behavior and sleep quality to influence learning motivation. Qualitative studies could also provide deeper insights into students' subjective experiences with gaming and sleep. Furthermore, intervention-based studies that target both gaming habits and sleep quality could provide valuable evidence on how these changes lead to improvements in learning motivation and academic achievement.

CONCLUSION

This study found that both the intensity of online gaming and sleep quality have a significant influence on students' learning motivation. The results show that excessive gaming and poor sleep quality are negatively correlated with academic motivation, while

managing gaming habits and improving sleep quality can positively impact learning motivation. These findings emphasize the importance of considering lifestyle factors such as online gaming intensity and sleep quality when developing strategies to improve academic outcomes, especially among students. By acknowledging the impact of these daily behaviors, educational institutions can design more effective programs to support motivation, engagement, and overall academic success, thereby creating an environment that fosters better learning outcomes.

The findings contribute to expanding the understanding of learning motivation by incorporating non-traditional factors such as online gaming intensity and sleep quality. While previous research has largely focused on cognitive and emotional aspects of motivation, this study highlights the significant role of everyday behaviors that are often overlooked. By examining the impact of gaming and sleep on motivation, this research provides a more holistic view of the factors influencing student success. This insight is particularly valuable in the context of medical education, where students face unique challenges and stressors that may be exacerbated by lifestyle factors like gaming habits and irregular sleep patterns.

The results of this study certainly have limitations, making it important to conduct further research, particularly in relation to the cross-sectional design and reliance on self-reported data. Future research could adopt a longitudinal design to track the long-term effects of online gaming intensity and sleep quality on students' learning motivation. Additionally, the use of objective measures—such as sleep tracking devices and software to monitor gaming activity—could improve data accuracy and minimize bias. Further studies could also explore how other psychological factors, such as stress, self-regulation, or social support, interact with gaming and sleep behaviours to better clarify their influence on learning motivation.

This study also suggests that educational institutions must adopt a more comprehensive approach to improving learning motivation by considering lifestyle factors such as online gaming intensity and sleep quality. Universities should incorporate guidance on digital balance and sleep management into their student support programs, recognizing that these factors are crucial for academic success. This approach could lead to significant improvements in students' learning motivation, reduce the negative effects of poor lifestyle habits, and create a more supportive and holistic educational environment. By addressing both academic and lifestyle factors, universities can better prepare students for success in their studies and in life beyond the campus.

ACKNOWLEDGMENT

played a crucial role in the completion of this project. We would also like to acknowledge the support and guidance provided by our academic advisors and faculty members at the Faculty of Medicine, Udayana University. Their expertise and encouragement throughout the research process have been invaluable.

BIBLIOGRAPHY

Alfiani, D. A., Nugraha, F. M., Mudiyanto, H., & Setiawan, D. (2023). The effects of online games on the students' motivation and its implications in learning. *Al Ibtida: Jurnal Pendidikan Guru MI*, *10*(1), 153–162. https://doi.org/10.24235/al.ibtida.snj.v10i1.11735

Amalia, N. P. (2022). *Hubungan intensitas bermain game online dengan motivasi belajar peserta didik kelas V SD Muhammadiyah 12 Setiabudi Pamulang* [Thesis, Universitas Islam Negeri Syarif Hidayatullah].

Buysse, D. J., Reynolds, C. F., Monk, T. H., Berman, S. R., & Kupfer, D. J. (1989). The Pittsburgh Sleep Quality Index: A new instrument for psychiatric practice and research. *Psychiatry Research, 28*(2), 193–213. https://doi.org/10.1016/0165-1781(89)90047-4

Campillo-Ferrer, J.-M., Miralles-Martínez, P., & Sánchez-Ibáñez, R. (2020). Gamification in higher education: Impact on student motivation and the acquisition of social and civic key competencies. *Sustainability*, *12*(12), 4822. https://doi.org/10.3390/su12124822

Chaplin, J. P. (2014). *Kamus lengkap psikologi* (K. Kartini, Ed.). PT Raja Grafindo Persada.

Deci, E. L., & Ryan, R. M. (1985). Conceptualizations of Intrinsic Motivation and Self-Determination. In *Intrinsic Motivation and Self-Determination in Human Behavior* (pp. 11–40). Springer. https://doi.org/10.1007/978-1-4899-2271-7_2

Duterte, J. P. (2024). The Impact of Educational Gamification on Student Learning Outcomes. *International Journal of Research and Innovation in Social Science*, *VIII*(X), 477–487. https://doi.org/10.47772/ijriss.2024.8100040

Fenny, & Supriatmo. (2016). Hubungan kualitas dan kuantitas tidur dengan penyakit kardiovaskular. *Jurnal Pendidikan Kedokteran Indonesia, 5*(3), 140–147.

Fitriyah Amaliyah. (2024). Literature Review: Gamification-Based Wordwall Application As an Evaluation of Elementary School Mathematics Learning. *Inventa*, *8*(2). https://doi.org/10.36456/inventa.8.2.a9595

Fresdina, M., & Kuntari, S. (2023). Dampak penggunaan game online terhadap hasil belajar mahasiswa Pendidikan Sosiologi angkatan 2020. *Edusociata: Jurnal Pendidikan Sosiologi, 6*, 305–312.

Gagné, M., & Deci, E. L. (2005). Self-determination theory and work motivation. *Journal of Organizational Behavior*, *26*(4), 331–362. https://doi.org/10.1002/job.322

Ghozali, I. (2018). *Aplikasi analisis multivariate dengan program IBM SPSS 25* (9th ed.). Badan Penerbit Universitas Diponegoro.

Guyton, A. C., & Hall, J. E. (2006). *Textbook of medical physiology* (11th ed.). Elsevier Saunders.

Husniah, Dewi, E. M. P., & Halima, A. (2025). Intensitas bermain game online terhadap motivasi belajar komunitas PUBG Mobile di Sulawesi Barat. *Jurnal Penelitian Pendidikan, Psikologi, dan Kesehatan (J-P3K), 6*(1), 189–196. https://doi.org/10.51849/j-p3k.v6i1.657

Khaldi, A., Bouzidi, R., & Nader, F. (2023). Gamification of e-learning in higher education: A systematic literature review. *Smart Learning Environments, 10*, 10. https://doi.org/10.1186/s40561-023-00227-z

Li, L., Hew, K. F., & Du, J. (2024). Gamification enhances student intrinsic motivation, perceptions of autonomy and relatedness, but minimal impact on competency: a meta-analysis and systematic review. *Educational Technology Research and Development, 72*, 765–796. https://doi.org/10.1007/s11423-023-10337-7

Maisa, E. A., Andrial, A., Murni, D., & Sidaria, S. (2021). Hubungan stres akademik dengan kualitas tidur mahasiswa keperawatan tingkat akhir program alih jenjang. *Jurnal Ilmiah Universitas Batanghari Jambi, 21*(1), 438–443. https://doi.org/10.33087/jiubj.v21i1.1345

Mei, S., Zheng, C., Liang, L., Kiyum, M., Yuan, T., Fei, J., Liu, K., Li, H., & Lin, X. (2025). The developmental trajectories and modifiable factors of adolescents' subjective well-being from late adolescence to early adulthood. *Child and Adolescent Psychiatry and Mental Health, 19*(1), 1–15. https://doi.org/10.1186/s13034-025-00881-w

Mellasanti Ayuwardani, Rara Ririn Budi Utaminingtyas, Rustono, R., Sri Eka Sadriatwati, & Irin Mirrah Luthfia. (2024). Entrepreneurial Students' Achievement Motivation towards Academic Excellence. *International Journal of Education, Vocational and Social Science, 3*(02), 30–38. https://doi.org/10.63922/ijevss.v3i02.693

Mtebe, J. S., & Raphael, C. (2013). Students' experiences and challenges of blended learning. *International Journal of Education and Development Using Information and Communication Technology (IJEDICT), 9*(3), 124–136. http://ijedict.dec.uwi.edu/viewarticle.php?id=1690

Muali, C., Aisyah, N., & Faizah, N. (2023). Student Motivation and Learning Outcomes Through Online Flipped Classroom Based on Student Self-Regulation in Coastal Areas. *PEDAGOGIK: Jurnal Pendidikan, 10*(2), 188–202. https://doi.org/10.33650/pjp.v10i2.5735

Mundir, A., Baharun, H., Soniya, S., & Hamimah, S. (2022). Childhood Behavior Management Strategy based on Fun Learning Environment. *Jurnal Obsesi : Jurnal Pendidikan Anak Usia Dini, 6*(4), 2583–2595. https://doi.org/10.31004/obsesi.v6i4.2063

Mundiri, A., & Sholehah, C. (2020). Childhood Mood Disorders During Pandemic; Learning Management Based on Self Discipline. *MANAGERE : Indonesian Journal of Educational Management, 2*(3), 331–344. https://doi.org/10.52627/ijeam.v2i3.65

Putra, F. F., Rozak, A., Perdana, G. V., & Maesharoh, I. (2019). Dampak game online terhadap perubahan perilaku sosial mahasiswa Telkom University. *Jurnal Politikom Indonesiana, 4*(2), 98–103. https://doi.org/10.35706/jpi.v4i2.3236

Rackley, E. D. (2021). "Blessings and Friends and Knowledge": Environmental Motivations for Religious Literacy. *Religious Education, 116*(2), 101–115. https://doi.org/10.1080/00344087.2020.1821303

Ratinho, E., Figueiredo, M., Estêvão, D., & Faísca, L. (2026). Gamification on mathematics engagement and motivation in secondary school and higher education: A systematic review and meta-analysis. *Educational Psychology Review, 38*, 16. https://doi.org/10.1007/s10648-025-10108-1

Ratinho, E., & Martins, C. (2023). The role of gamified learning strategies in student's motivation in high school and higher education: A systematic review. *Heliyon*, *9*(8), e19033. https://doi.org/10.1016/j.heliyon.2023.e19033

Rozi, F., & Kamalia, S. (2023). Creating Positive Learning Environment Through Work-Life Balance Based Human Resource Development. *PEDAGOGIK: Jurnal Pendidikan*, *10*(1), 32–45. https://doi.org/10.33650/pjp.v10i1.5575

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, *55*(1), 68–78. https://doi.org/10.1037/0003-066X.55.1.68

Ryan, R. M., & Deci, E. L. (2020). Intrinsic and extrinsic motivation from a self-determination theory perspective: Definitions, theory, practices, and future directions. *Contemporary Educational Psychology*, *61*, 101860. https://doi.org/10.1016/j.cedpsych.2020.101860

Sandya, S. N., & Ramadhani, A. (2021). Pengaruh intensitas bermain game online terhadap prokrastinasi akademik mahasiswa. *Psikoborneo: Jurnal Ilmiah Psikologi, 9*(1), 202–213. https://doi.org/10.30872/psikoborneo

Sugiarti, T., Suryani, & Sudyasih, T. (2025). Hubungan kualitas tidur dengan motivasi belajar mahasiswa keperawatan Universitas 'Aisyiyah Yogyakarta. *Jurnal Ilmu Psikologi dan Kesehatan, 1*(4), 317–323. https://jurnal.kopusindo.com/index.php/jipk/index

Sukamto, I. S., Jayanthi, S., & Nursamsu. (2024). Hubungan antara kualitas tidur dengan konsentrasi belajar pada mahasiswa pendidikan biologi. *Mukadimah: Jurnal Pendidikan, Sejarah, dan Ilmu-ilmu Sosial, 8*(2), 399–406. https://doi.org/10.30743/mkd.v8i2.9152

Sun, L., Kangas, M., & Ruokamo, H. (2024). Game-based features in intelligent game-based learning environments: a systematic literature review. *Interactive Learning Environments*, *32*(7), 3431–3447. https://doi.org/10.1080/10494820.2023.2179638

Sutarti, T., Wati, D. R., Abdul, M., & Anwar, M. (2018). Relationship of sleep quality with student learning motivation in Nursing Academy 17 of Karanganyar. *Indian Journal of Public Health Research & Development, 9*(12), 1685–1689.

Umar, U. (2023). Deepening Convictions; Leading for Religious Literacy Based on Pesantren. *PEDAGOGIK: Jurnal Pendidikan*, *10*(2), 151–167. https://doi.org/10.33650/pjp.v10i2.7012

Uno, H. B. (2018). *Teori motivasi & pengukurannya.* Bumi Aksara.

Zou, H., Yao, J., Zhang, Y., & Huang, X. (2024a). The influence of teachers' intrinsic motivation on students' intrinsic motivation: The mediating role of teachers' motivating style and teacher-student relationships. *Psychology in the Schools*, *61*(1), 272–286. https://doi.org/10.1002/PITS.23050

Zou, H., Yao, J., Zhang, Y., & Huang, X. (2024b). The influence of teachers' intrinsic motivation on students' intrinsic motivation: The mediating role of teachers' motivating style and teacher-student relationships. *Psychology in the Schools*, *61*(1), 272–286. https://doi.org/10.1002/PITS.23050