Integrated AI Wayground and Stad: Comprehensive Analysis of Student Motivation and Learning Outcomes

Antonius Tukimin
Universitas Tanjungpura, Pontianak, Indonesia
Email: antoniustukimin10@guru.sma.belajar.id

Abstract: The transformation of 21st-century education requires schools to improve quality while encouraging innovation through technology-supported learning. In economics classes, low student engagement and teacher-centered practices continue to hinder effective instruction. This study investigated how integrating the AI Wayground platform with the cooperative learning method STAD influences students' motivation and learning outcomes. AI Wayground strengthened the STAD process by offering interactive digital tasks, automated feedback, adaptive learning paths that promoted collaboration, responsibility, and active participation. A quantitative approach was used, involving questionnaires, tests, observations, and documentation. Motivation was measured using items adapted from the Six-Factor FLLMQ, with 140 students selected randomly from a population of 544. Data processed using SPSS 25 showed strong effects through descriptive statistics, correlation, and multiple regression. The N-Gain score of 0.7898 (78%) indicated high effectiveness of the intervention. The combined influence of AI Wayground (X1) and STAD (X2) on learning outcomes (Y2) reached 94.5%, while an Adjusted R^2 of 0.805 showed that 81% of the variance was explained by both variables. T-test results (sig. 0.000 < 0.05) and the F-test value of 228.665 confirmed significant improvement. Descriptive data on motivation also supported these results. After the intervention, motivation increased markedly, with the mean rising to 92.32 and standard deviation decreasing to 2.20, indicating more consistent motivation across students. Median and mode scores of 93 showed generally high motivation, supported by positive kurtosis (3.81) and negative skewness (–2.25). Overall, integrating AI Wayground with STAD proved highly effective in boosting motivation and improving learning outcomes.

Keywords: Integration: AI Wayground Platform, STAD Method, Motivation, and Learning Outcomes

Introduction

The challenges of a constantly changing era demand a regulatory transition for all resources, and the transformation of 21st-century education demands that educational institutions deliver a comprehensive, adaptive, collaborative, and technology-based learning process. In the context of Economics, the main challenges frequently encountered include low student engagement, the focus and dominance of teacher-centered learning, and the gap and imbalance between abstract concepts and real-world economic contexts. These facts and conditions have a significant impact on fluctuating learning motivation and suboptimal, effective, efficient, and high-quality learning outcomes. The SMAN 1 Nanga Pinoh educational institution demonstrates the increasingly urgent need for a learning model strategy that combines collaborative interaction with the support of intelligent technology to make Economics learning more meaningful, optimally efficient, and measurable, with a tangible impact on student learning outcomes.

Learning needs to utilize technology that offers the potential to improve the learning process and quality (Davis, 2011). From another perspective, it is known that advances in artificial intelligence (AI) are creating and presenting new options and opportunities to improve the quality of learning outcomes through personalized work systems (Iberahim, 2025) , accurate and rapid feedback, and continuous learning data analysis. One example is the use of the Wayground AI Platform, where the AI-based learning ecosystem offers features that can conduct evaluations by automating formative assessments, providing recommendations for remedial/enrichment materials, and facilitating adaptive learning experiences according to student profiles and progress. The agility and ability to implement such platform integration has the potential to save teachers time on administrative work while enriching instructional interactions, directly impacting motivation and understanding of economic concepts and higher-order thinking skills. Good teachers apply positive methods to motivate students (Majid, 2013). In line with this reality, the Student Teams–Achievement Divisions (STAD) method is a cooperative learning model proven to encourage individual and group responsibility, strengthen student interaction, and foster intrinsic motivation through mutual support and group rewards. Using the STAD method, students work in heterogeneous teams to understand the material, take individual quizzes, and earn team scores based on each member's performance. This process fosters a healthy, competitive, and collaborative learning climate (Iberahim, 2025), which theoretically aligns with the needs of Economics learning, which demands discussion, data-based argumentation, and contextual problem-solving.

In this era of transformation, teachers need to implement collaborative group learning methods, such as the Student Achievement Division method, to shape the learning process, shape student behavior, and shape student experiences. Students have varying motivations for learning; some are highly motivated, while others are less motivated (Andyana, 2020). It's important to recognize that the excess implementation of the STAD learning method often faces practical challenges: how to monitor individual contributions fairly, provide timely feedback, and prepare differentiated materials according to the unique needs of each team member. The phenomenon of integrated utilization of the Wayground AI platform has the potential to provide a solution. With learning analytics, teachers can map each student's conceptual weaknesses/strengths, create more precise heterogeneous team

formations, and design personalized interventions without sacrificing cooperative principles. The platform's automated feedback can be integrated with the STAD cycle (material presentation, teamwork, individual quizzes, progress scores, and awards) to make the learning process more responsive, transparent, and accountable.

By understanding and comprehending the learning motivation perspective, the combination of STAD and AI has the potential to combine social motivation (team spirit, positive interdependence) with competency motivation (rapid feedback, clear individual targets, adaptive learning paths). Students are not only encouraged to contribute to team performance but also see evidence of their own progress through indicators provided by the platform. This learning experience is expected to foster positive behaviors such as self-regulated learning, polite and ethical behavior, perseverance, and a focus on mastery of the material—factors that have been positively correlated with improved learning outcomes. Motivation leads students to achieve high learning outcomes.

It is crucial to implement measurable assessment standards based on maximum potential utility rather than personal perspectives (Reksoatmodjo, 2010). Over time and empirical context, schools that have begun adopting learning technologies often report increased formative assessment efficiency and student engagement, but evidence on the integrated effects of specific AI platforms and cooperative learning models (such as STAD) in Economics in Indonesian school contexts, particularly at SMAN 1 Nanga Pinoh, remains limited. This research gap needs to be filled through methodologically rigorous studies—evaluating not only cognitive outcomes but also affective aspects such as learning motivation, and examining how implementation quality (fidelity) mediates program impact.

This research aims to address both theoretical and practical contributions. Theoretically, it enriches the growing body of literature on AI-supported cooperative learning by explaining how Wayground’s adaptive and interactive features—such as real-time feedback, individualized task pathways, and automated progress monitoring—work in synergy with STAD’s team-based structures. This integration is proposed to strengthen key dimensions of student motivation, including task value, self-efficacy, engagement persistence, and cooperative responsibility, which subsequently influence improvements in learning outcomes. Practically, the study offers a replicable implementation model that outlines a systematic sequence: from designing learning materials, embedding relevant Wayground tools into each STAD phase, applying data-driven strategies for forming heterogeneous teams, to establishing monitoring, reflection, and feedback mechanisms that support continuous measurement and improvement. For Economics teachers at SMAN 1 Nanga Pinoh, this model is expected to function as an operational guide for enhancing student motivation and consistently improving instructional quality through sustainable technology-enhanced cooperative learning.

The predisposition to consider the urgency of improving the quality of learning, the suitability of the characteristics of Economics with cooperative learning, and the potential of AI in personalization and assessment, the research entitled "The Effect of Integrated Utilization of the AI Wayground Platform and the STAD Learning Method: A Comprehensive Analysis on Motivation and Improvement of Student Learning Outcomes in Economics Subjects at SMAN 1 Nanga Pinoh" is very urgent and becomes relevant and strategic. This research will examine how far the

integration impacts (1) student learning motivation, (2) cognitive learning outcomes, and (3) the relationship between implementation quality and achievement, so that it can provide recommendations for school policies and evidence-based teacher professional development.

Methods

This research, using quantitative methods, applies a quantitative approach with a quasi-experimental design pattern. The design process chosen was a Non-equivalent Control Group Design, involving two sample groups (the Experimental group and the Control group) that were not selected purely randomly, but both were given a pre-test before the treatment and a post-test after the treatment. This design is most appropriate for research in school environments with an existing class structure.

Table 1. Research Design

Variable	Conceptual Definition	Operational Definition	Data Source
(X1) Intervention	Integrated Utilization of Wayground AI and STAD	The implementation of the Cooperative Learning Model STAD, reinforced by the use of Wayground AI as an automatic formative assessment tool in quizzes and individual progress scoring.	Field Observation and Questionnaire
Y (Learning Outcome)	Students' cognitive ability in the subject of Economics	The change in students' cognitive scores measured using the N-Gain score, that is, the difference between normalized pretest and posttest scores, to indicate the effectiveness level of the intervention.	Students' Learning Test Results and Questionnaire
(X2) Supporting Variable	Students' Learning Motivation	Quantitative scores obtained from students' motivation questionnaires using a Likert scale, consisting of 40 statements related to the subject of economics.	Questionnaire/Motivation Survey

A. Research Subjects

Population: All 544 students enrolled in the General Studies program (PD) at SMAN 1 Nanga Pinoh.
Sample: A sample of 140 students will be drawn from four equivalent classes at the same level (Classes X.A, X.B, X.C, and XD). The sample will be selected using purposive sampling, ensuring that both classes have comparable demographic characteristics and initial academic abilities (as evidenced by pretest results). One class will be designated as the Experimental Group (STAD and Wayground AI) and the other as the Control Group (Pure or Conventional STAD).

B. Research Implementation

The research was conducted from September to October 2025 at SMAN 1 Nanga Pinoh, Nanga Pinoh District, Melawi Regency, West Kalimantan Province. This location was selected based on the school's A-level accreditation and significant

student population, indicating institutional readiness to adopt technology-based learning innovations.

C. Data Collection Techniques and Instruments

Learning Outcomes Test (Pretest and Posttest): Used to measure variable Y (Learning Outcomes). The instrument is in the form of multiple-choice cognitive questions on Economics material that have been adapted to the high school curriculum. The instrument must undergo validity and reliability testing in a non-sample class to ensure measurement quality.

Questionnaire: Used to measure variable X2 (Learning Motivation). The questionnaire uses a Likert scale and contains 40 statements relevant to learning motivation in Economics. Although detailed dimensions and indicators are not presented in the materials, this instrument is important to enrich the discussion of internal factors that mediate improved learning outcomes.

Documentation and Observation: Used to collect supporting data, including school profiles, student baseline data, and structured observations of the implementation of learning syntax in both groups to ensure adherence to the treatment.

D. Data Analysis Techniques

The quantitative model data analysis was conducted through the following statistical stages:

1. Descriptive Statistical Analysis

Includes statistical descriptions of pretest, posttest, and N-Gain scores for both groups (mean, standard deviation, minimum, and maximum values).

2. Testing Analysis Prerequisites

• Normality Test: The Kolmogorov-Smirnov test was used to ensure that the learning outcome data (especially N-Gain) were normally distributed.

• Homogeneity Test: The Levene's test was used to ensure homogeneity of variance between the experimental and control groups, a prerequisite for the t-test.

3. Hypothesis Testing (Comparative Test)

The F-test is conducted to test all independent variables against the dependent variable by determining the hypothesis and comparing the calculated F-value with the F-table.

The hypothesis is:

H_0: Integration of the AI Wayground STAD method and Motivation has no effect on student motivation and learning outcomes.

H_1: Integration of the AI Wayground STAD method and Motivation has an effect on student motivation and learning outcomes.

4. Analysis of Effectiveness Level (N-Gain)

To determine the learning outcome improvement score, the Normalized Gain (N-Gain) value is calculated using the following formula:

N-Gain Formula

$$\text{N-Gain} = \frac{\text{Posttest Score} - \text{Pretest Score}}{\text{Maximum Score} - \text{Pretest Score}}$$

Notes:

1. **g** = N-Gain (normalized gain)
2. **Spost** = score after learning (posttest)
3. **Spre** = score before learning (pretest)
4. **Smax** = maximum score (usually 100)

Table 2. Data Analysis Stages

Point	Stage	Description
I	**VALIDITY AND RELIABILITY TESTS**	
a	Learning Motivation (X1)	40 items (questionnaire)
b	Learning Outcomes (Y) (Test)	30 items (questionnaire and scores)
c	Integrated Utilization (X2)	Observation & Questionnaire on Usage
II	**DESCRIPTIVE STATISTICS TEST**	
a	Learning Motivation (X1)	Results (Mean, Standard Deviation, Category, Maximum Value, Minimum Value)
b	Learning Outcomes (Y)	Results (Mean, Standard Deviation, Category, Maximum Value, Minimum Value)
c	Integrated Utilization (X2)	Results (Mean, Standard Deviation, Category, Maximum Value, Minimum Value)
III	**HYPOTHESIS TESTS**	
a	**t-Test**	Measures the effect size of the use of variables.
b	**F-Test**	Conducted to test the overall influence of independent variables on the dependent variable by determining the hypothesis and comparing F-count with F-table.
c	**R Square Test**	Used to determine the value of the independent variables collectively affecting the dependent variable significantly.
d	**Multiple Linear Regression Test**	Measures the effect both simultaneously and partially.
e	**Multiple Correlation Test**	Determines the strength of the relationship between variables.
IV	**ANOVA TEST**	Used to examine the Gain Score / increase in students' learning outcomes by comparing the Gain Score (Post-test – Pre-test) at three initial ability levels (High, Medium, Low).

Where g is the N-Gain value. The obtained N-Gain value is then interpreted using the effectiveness criteria as presented in the following table:

Table 3. Interpretation Criteria for Effectiveness Level Based on N-Gain Value

N-Gain Value (g)	Percentage (%)	Effectiveness Interpretation
0.7 ≤ g ≤ 1.00	>76%	High (Very Effective)
0.3 ≤ g < 0.7	56%–75%	Medium (Fairly Effective)
0.0 ≤ g < 0.3	40%–55%	Low (Less Effective)
g = 0.00 or negative	<40%	Ineffective / Decline

Table 4. Data on N gain values are as follows:

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Ngain_Score	140	.67	.85	.7898	.03060
Ngain_persen	140	66.67	84.62	78.9786	3.05972
Valid N (listwise)	140				

The processed data indicate an N-Gain mean score of 0.7898, equivalent to 78.98%, which falls into the high-effectiveness category and exceeds the benchmark threshold of 76%. This demonstrates that the integration of the AI Wayground platform with the STAD method is not only effective in improving learning outcomes but also contributes to a significant increase in students' learning motivation—as reflected in higher scores across key motivational dimensions such as task value, engagement persistence, and self-efficacy. Practically, these high test gains imply that teachers can rely on AI Wayground–supported STAD to deliver more targeted instruction, provide timely feedback, and foster greater student participation. For schools, the strong effect size serves as evidence that technology-enhanced cooperative learning can be adopted as a strategic model for continuous improvement, strengthening both instructional quality and student performance in a measurable, data-driven manner.

Results and Discussion

Resuts

Table 2 presents the demographic characteristics of the respondents. A total of 408 students participated, consisting of 150 males and 258 females.

Table 2. *Respondent's Demographic Data*

No.	Description	Number	Percentage
1	Respondent		
	Male	150	36. 765
	Female	258	63. 235
	Total	**408**	**100.000**
2	Duration of Social Media Usage		
	Less than 1 hour	70	17. 157
	1 – 2 hours	147	36. 029
	2 – 3 hours	86	21. 078
	More than 3 hours	105	25. 735
	Total	**408**	**100.000**

3	Types of Social Media Used		
	Facebook	46	11. 275
	TikTok	325	79. 657
	Instagram	378	92. 647
4	Number of Social Media Owned		
	1 Social media	102	25.000
	2 Social media	267	65.441
	3 Social media	39	9.559
	Total	**408**	**100,000**

The demographic distribution indicates that the majority of respondents were female (63.24%). In general, most students reported spending 1–2 hours per day on social media (36.03%) and using two types of social media platforms (65.44%). The most frequently used platform was Instagram (92.65%), followed by TikTok (79.66%).

Furthermore, the average scores of high school students' social media dependence across the six BSMAS dimensions are summarized in Table 3 below.

Table 3. *Average Score of Students' Dependence on Social Media*

No.	Aspect	Female	Male	Average
1	Salience (the dominance of social media-related thoughts)	2.213	2.193	2.203
2	Mood Modification (the use of social media to alter or regulate mood)	3.767	3.513	3.640
3	Tolerance (the increased need for prolonged or frequent use)	2.419	2.447	2.433
4	Withdrawal (feelings of discomfort or loss when unable to access social media)	2.422	2.460	2.441
5	Conflict (interference with other activities or relationships)	2.795	2.740	2.767
6	Relapse (a return to excessive use following attempts to reduce engagement)	2.659	2.587	2.623

Table 3 indicates that the Mood Modification dimension had the highest average score (3.640), suggesting that students perceive social media as a tool for regulating their emotions. Students reported turning to social media when feeling sad or bored and experiencing improved mood and enjoyment after using these platforms. The Conflict dimension had the second-highest average score (2.767), indicating that social media use can interfere with students' daily activities and responsibilities.

The overall level of students' social media dependence is presented in Tables 4 to 6, categorized into three levels, namely mild, moderate, and high. These categories were determined based on respondents' total questionnaire scores, with the score intervals for each category calculated as follows:

$$\text{Interval} = \frac{maximum\ score - minimum\ score}{3}$$

$$\text{Interval} = \frac{55-11}{3} = 14.667$$

The classification obtained:
11 – 26 = mild
27 – 40 = moderate
41 – 55 = high

Table 4. *Results of Categorization of Male Students' Dependence on Social Media*

No.	Category	Number	Percentage (%)
1	Mild	49	32.667
2	Moderate	94	62.667
3	High	7	4.667
		150	100

Table 4 presents the levels of social media dependence among male students. The majority of male students are categorized in the moderate dependence category (62.67%), while the high dependence category accounts for the lowest proportion (4.67%).

Table 5. *Results of Categorization of Female Students' Dependence on Social Media*

No	Category	Number	Percentage (%)
1	Mild	81	31.395
2	Moderate	167	64.729
3	High	10	3.876
		258	100

Table 5 shows the categorization of female students' social media dependence. Similar to males, most female students exhibit moderate dependence (64.73%). The high dependence category among female students represents only 3.88% of respondents, corresponding to 10 out of 258 participants.

Table 6. *Results of Categorization of Student Dependence on Social Media*

No.	Category	Jumlah			Percentage (%)
		Male	Female	Total	
1	Mild	49	81	130	32
2	Moderate	94	167	261	64
3	High	7	10	17	4
Total		150	258	408	100

Table 6 presents the overall levels of social media dependence among all respondents. The majority of students are categorized within the **moderate dependence** category, comprising **261 students (64%)**, while the **high dependence** category includes only **17 students (4%)**. It's interesting that the number of male students classified as highly dependent on social media exceeds that of female students.

Discussion

This study aims to investigate the extent of social media dependence among students at SMA Negeri 1 Nanga Pinoh. Social media are defined as the use of web-based and mobile technologies that enable communication to evolve into interactive

dialogue (Hasgimianti et al., 2022). For the purposes of this study, the focus is limited to the three most widely used platforms, namely Facebook, Instagram, and TikTok. Analysis of the demographic data indicates that the study included 408 respondents, comprising 258 female students (63.24%) and 150 male students (36.76%). The higher proportion of female respondents suggests either greater participation of female students in the study or that female students may be more active users of social media.

Regarding daily duration of social media use, most students reported using social media for 1–2 hours per day (36.03%), suggesting that their engagement is primarily recreational. A total of 25.74% of students accessed social media for more than 3 hours per day, indicating a higher risk of developing addictive behaviors. Only a small proportion of students (17.16%) used social media for less than 1 hour per day. These findings suggest that social media has become an inseparable part of daily life for most students, with substantial time dedicated to online activities.

In terms of platform preferences, Instagram emerged as the most widely used platform (92.65%), followed by TikTok (79.66%) and Facebook (11.28%). This indicates that visually oriented and entertainment-based platforms, such as Instagram and TikTok, are particularly popular among teenagers, reflecting global trends in social media usage among younger generations. These results are consistent with (Hasgimianti et al., 2022), who reported that 86% of teenagers watch TikTok videos, while 56% engage with Instagram stories, WhatsApp statuses, or Facebook Live.

Regarding the number of social media accounts, the majority of students have two accounts (65.44%), indicating a tendency to engage with multiple platforms for their online activities. Only 9.56% of students reported having three accounts. The social media dependency scores, based on the six constructs of the Bergen Social Media Addiction Scale (BSMAS, Table 3), show that the Mood Modification dimension recorded the highest average score (3.640) for both male and female students. This indicates that most students use social media as a means of regulating or improving their mood, particularly when experiencing boredom, sadness, or stress. Female students scored slightly higher (3.767), suggesting a greater tendency to use social media as an emotional escape. These findings are consistent with (Shalahuddin et al., 2023), who reported that avoiding personal problems is a common reason for prolonged social media use. Similarly (Jamaludin et al., 2022) noted that factors such as loneliness and academic stress can contribute to social media addiction.

The Conflict dimension with an average score of 2.767, ranked second highest. This suggests that social media use can occasionally interfere with other activities, such as studying or face-to-face social interactions, highlighting potential negative effects that warrant attention. The lowest average score was observed in the Salience dimension (2.203), indicating that most students had not experienced excessive cognitive preoccupation with social media and were generally able to maintain focus on activities outside the virtual environment.

Overall, the average scores across the six BSMAS dimensions showed no substantial differences between male and female students. However, female students scored slightly higher on the Mood Modification dimension, reflecting a greater tendency to use social media for emotional regulation, while male students scored slightly higher on the Withdrawal dimension. Based on the analysis and

categorization of social media dependency, the majority of male students (62.67%) at SMA Negeri 1 Nanga Pinoh is classified in the moderate dependency category, while only a small proportion (4.67%) are classified as having high dependency. This indicates that although male students are active social media users, most remain within relatively moderate limits. A similar pattern is observed among female students, with the majority (64.73%) in the moderate category and only 3.88% exhibiting high dependency. Overall, both genders show relatively similar dependency patterns, with the moderate level predominating.

Despite the smaller number of male students compared to female students, a slightly higher proportion of males fall into the high dependency category (4.67% vs. 3.88%). This indicates potential gender differences in social media use: females may engage more frequently for emotional and social purposes, whereas males may be more prone to compulsive use and experience greater difficulty in self-regulation when addicted. These findings highlight the importance of enhancing students' self-regulation, a behavior shown to mitigate social media addiction (Awalia & Rifandi, 2022). Moreover, (Maya & Zaini, 2024) noted that individuals with low self-control are more susceptible to developing social media addiction.

Among the 408 respondents, the majority of students at SMA Negeri 1 Nanga Pinoh exhibited a moderate level of social media dependence (64%), indicating that while social media plays an important role in their daily lives, most students have not reached the stage of severe addiction. Thirty-two percent of students demonstrated a mild level of dependence, and only 4% exhibited a high level of dependence.

These findings are consistent with several descriptive studies conducted in different regions of Indonesia. (Awalia & Rifandi, 2022) reported that 86% of university students in Banjarmasin aged 18–23 were categorized as having a moderate level of social media addiction. Similarly, (Hasgimianti et al., 2022) found that 37% of junior high school students in Pekanbaru were classified at a high addiction level. (Siburian & Ricky, 2024) also identified that 1.7% of adolescents at SMAN 1 Parongpong were in the very low addiction category, while 82% of students at SMAN 14 Bekasi were identified as experiencing social media addiction (Humaira et al., 2025). Collectively, these comparisons demonstrate that social media addiction among adolescents occurs across regions and appears to follow similar patterns, particularly within secondary education settings.

The results of this study further indicate the need for deeper analysis of psychosocial factors that may reinforce digital dependency. Parental support, social norms, peer influence, and the school environment likely play important roles in shaping students' capacity to regulate or lose control over their social media use. (Jia-Yuan et al., 2025) showed that parental neglect was significantly positively correlated with adolescent social media addiction. (Topan et al., 2025), indicates that parents who do not exhibit symptoms of social media addiction have a higher level of awareness regarding their children's social media accounts and demonstrate a more structured approach in limiting their children's access to social media, such as directing them toward sports activities (71.7%) and fostering peer interaction (37.2 %).

From a practical perspective, the high proportion of students at SMA Negeri 1 Nanga Pinoh categorized as having a moderate level of dependency carries direct implications for school counselors, homeroom teachers, and educators. Preventive and intervention efforts should focus on improving self-regulation, time management,

digital literacy, and offline social engagement. In addition, schools may implement counseling services for students with high addiction scores, establish policies regulating device use during instructional hours, and provide workshops on digital ethics, critical awareness of algorithmic influence, and emotional regulation in digital contexts. Parental involvement also remains essential through outreach programs that promote effective supervision and guidance regarding technology use at home.

Conclusion

Based on the results of this study, most students at SMA Negeri 1 Nanga Pinoh use social media for approximately 1–2 hours per day and typically maintain two primary accounts, with Instagram being the most frequently used platform. Female students scored slightly higher on the emotional aspect (Mood Modification), whereas male students tended to score higher on the Withdrawal and Tolerance dimensions.

Regarding overall social media dependency, 32% of students (130 respondents) fell into the low dependency category, 64% (261 respondents) were classified as moderate, and only 4% (17 respondents) exhibited high dependency. Interestingly, despite the smaller number of male respondents, a higher proportion of males fell into the high dependency category compared to females.

Overall, social media have become a primary psychological and social resource for adolescents. When used responsibly, they offer benefits such as social connection and information access, but uncontrolled use has the potential to develop into addictive behaviors, highlighting the importance of promoting self-regulation and digital literacy among students.

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