Journal of Economics, Finance and Management Studies

ISSN (print): 2644-0490, ISSN (online): 2644-0504

Volume 09 Issue 03 March 2026

Article DOI: 10.47191/jefms/v9-i3-11, Impact Factor: 8.735

Page No: 1272-1280

The Brain Reward System and High School Students Learning Behavior in Banten Province

Prof. Dr. Sudadio, M. Pd[1], Evi Afiati[2], Qoriah Rahmawati[3], Agam Gunawan[4], Adang Sutarman[5], Rizdki Elang Gumelar[6]

ABSTRACT: This study examines how the brain's reward system contributes to shaping learning patterns and influencing the academic outcomes of Grade 10 students in Banten Province. Employing a quantitative correlational design, the study involved 153 students from public senior high schools located in Serang, Tangerang, and South Tangerang. Students' responsiveness to reward was measured using a Likert-scale instrument comprising eight statements, while learning-outcome data were obtained from school-verified report-card grades. Pearson correlation analysis revealed a positive, relatively weak but statistically significant relationship between reward sensitivity and academic performance ($r = 0.1719; p < 0.05$). The coefficient of determination ($R^2 = 2.96\%$) indicates that reward-related factors account for only a small proportion of the variance in students' achievement. These findings suggest that activation of the brain reward system may enhance learning motivation, yet it is not sufficiently strong to serve as a primary determinant of academic success. Therefore, this study highlights the need for more comprehensive instructional strategies that integrate students' intrinsic motivation with a supportive learning environment.

KEYWORDS: Brain Reward System, Learning Behavior, Academic Performance, Neuroscience-Based Education, Motivation

1. INTRODUCTION

The dynamics of 21st-century education increasingly underscore the importance of integrating pedagogy, psychology, and neuroscience. Learning processes are no longer viewed solely as cognitive activities but as a series of behaviors influenced by emotional states, motivational strength, and underlying brain mechanisms (Sousa, 2017:43). One neural system playing a pivotal role in enhancing learning engagement is the reward system, particularly the mesolimbic dopamine pathway, which governs sensations of pleasure, reinforcement, and behavioral drive upon receiving positive feedback or achieving success (Schultz, 2016:189). Activation of this system accounts for learners' propensity to repeat behaviors associated with prior positive experiences.

In educational contexts, various forms of reinforcement from teacher praise and recognition to grade achievements and feelings of accomplishment can trigger dopamine release, thereby fostering student focus, perseverance, and readiness to learn (Jensen, 2008:65). Although such rewards have been shown to boost motivation and learning preparedness (Deci & Ryan, 2009:250), their implementation in schools often lacks alignment with core neuroscientific principles, resulting in inconsistent effects on academic performance.

Academic achievement remains the primary indicator of educational quality, shaped by cognitive abilities, emotional stability, intrinsic motivation, and students' neuropsychological readiness (Ormrod et al., 2020:89). While theories indicate meaningful links between brain reward mechanisms and academic outcomes, empirical studies directly testing these associations at the senior high school level in Indonesia remain limited. This gap highlights the need for research examining how students' responsiveness to rewards correlates with their learning outcomes.

The brain's reward system represents a critical neurobiological mechanism that directs motivation, emotional responses, and reinforced behaviors during learning processes (Schultz, 2016:190). This mechanism operates via the mesolimbic dopamine pathway, which activates during pleasurable experiences such as success, appreciation, or positive feedback. During adolescence, the brain undergoes a highly dynamic phase of development and reorganization, rendering learners particularly sensitive to reinforcement stimuli, as neural structures governing motivation, emotion, and behavioral control remain in maturation (Santrock, 2019:57).

Consequently, rewards whether verbal praise, social acceptance, or performance gains provide substantial impetus for student focus, perseverance, and engagement in challenging academic tasks.

In classroom settings, teachers frequently employ diverse reinforcement strategies to foster positive behaviors and sustain academic participation. When applied with a solid grasp of neuroscientific principles, these techniques activate the reward system to enhance student readiness, attention, and learning commitment (Durlak et al., 2011:407). Educational neuroscience perspectives further affirm that reinforcements aligned with natural reward pathways strengthen emotional engagement, extend attentional capacity, and improve learning quality (Ames, 2019:65). Thus, the reward mechanism influences not only short-term learning responses but also contributes to the formation of consistent long-term study habits.

Concentration, a primary executive function, plays a vital role in facilitating information absorption and optimal academic outcomes. Dopaminergic activity reinforces neural connections that regulate goal-directed behavior and sustained focus, enabling students to resist distractions during instruction (Schultz, 2016:191). Meanwhile, motivation emerges when psychological needs for competence, autonomy, and social relatedness are met (Deci & Ryan, 2009:267). Reward system activation generates positive emotions that propel intrinsic motivation, sustaining student involvement amid demanding or perseverance-requiring learning tasks.

Learning readiness encompassing physical and psychological dimensions significantly determines the efficacy of the reward system in supporting instruction. Supportive school environments, emotional stability, and preserved mental well-being serve as essential preconditions for effective reinforcement (Kim & Sheridan, 2020:307). When these supportive elements are in place, the motivational impact of the reward system intensifies, ultimately yielding more meaningful learning experiences and superior academic performance.

This phenomenon underscores the urgent need for a more rigorous scientific examination of how the brain reward system relates to students' academic outcomes. Beyond establishing statistical correlations, this study elucidates the neuropsychological understanding that learning success hinges on biological mechanisms driving intrinsic motivation. Such insights equip educators to design brain-aligned instructional strategies, thereby advancing evidence-based education in modern contexts.

2. THEORETICAL FRAMEWORK

The brain's reward system comprises a series of neurobiological mechanisms that play a crucial role in generating pleasurable sensations, motivation, and behavioral drive when an individual receives a reward or experiences success. In the field of neuroscience, this system operates within the mesocorticolimbic dopaminergic pathway, which involves key areas such as the ventral tegmental area (VTA), the nucleus accumbens, and the prefrontal cortex (Purves et al., 2018). Activation of this system triggers the release of dopamine, a neurotransmitter that reinforces certain behaviors, thereby encouraging individuals to repeat them.

In the educational context, rewards may take various forms, such as verbal praise, good grades, teacher attention, peer recognition, or the intrinsic satisfaction of mastering a subject. All these types of rewards function through similar neurobiological processes by stimulating dopamine release and eliciting positive emotions that enhance the willingness to learn (Jensen, 2008:65). Reward mechanisms can activate motivational centers, making students more energetic, focused, and ready to absorb new information. However, the use of rewards must be applied judiciously. Extrinsic or manipulative rewards may undermine intrinsic motivation, leading students to learn merely for the sake of receiving external incentives. Therefore, effective rewards should encourage self-regulated learning rather than providing only temporary motivation.

Learning outcomes refer to the changes in behavior or abilities that students acquire after engaging in the learning process. These outcomes encompass cognitive, affective, and psychomotor domains, as described in Bloom's taxonomy of educational objectives (Anderson & Krathwohl, 2001:124). Learning outcomes do not solely assess intellectual ability; they also measure how students understand, apply, analyze, and evaluate information. According to Slavin (Slavin, 2018:22), learning outcomes are manifestations of the interaction among students' basic abilities, instructional quality, motivation, and learning environment. This implies that academic achievement does not exist in isolation but depends on both instructional and psychological contexts. In this study, learning outcomes are assessed through two evaluation components (Y1 and Y2), whose average scores represent students' performance after a specific learning period.

The factors that influence learning outcomes are determined by both internal and external factors (Schunk, 2020:188). Internal factors include motivation, attention and concentration, cognitive ability, and neuropsychological conditions such as reward responses. Meanwhile, external factors encompass instructional methods, teacher–student interactions, the learning environment, and family support. In the context of this study, the focus is directed toward internal mechanisms specifically, how the brain's reward system contributes to students' learning outcomes.

Learning evaluation is a continuous process of collecting and interpreting information to assess and inform decisions in the design of

an instructional system (Febriana, 2019:68). The term learning evaluation is often equated with testing. Although related, these two concepts are not identical. Daily classroom tests or even final school examinations do not fully capture the essence of learning evaluation, particularly within the framework of the 2013 Curriculum. Essentially, learning evaluation not only measures learning outcomes but also examines the processes experienced by both educators and learners throughout the entire learning cycle (Asrul et al., 2014:95).

The relationship between the reward mechanism and learning outcomes has long been discussed in modern learning theories. When the reward system is activated, students experience positive emotions and show greater motivation to engage in academic activities. Dopamine plays a crucial role in enhancing focus, working memory, and decision-making abilities (Purves et al., 2018:90). Raharjo et al., (2023:156) argue that enjoyable and curiosity-driven learning experiences activate the reward pathway, making it easier for students to absorb and retain information. This view is supported by Ormrod et al., (2020:34), who found that positive learning experiences improve long-term memory retention. Thus, it can be concluded that the brain's reward system influences learning outcomes through mechanisms involving motivation, attention, and the enhancement of cognitive functions.

3. RESEARCH METHODS

This study employed a quantitative approach with a correlational survey design to examine the relationship between students' responses to reward-based stimuli and their academic achievement. This design was chosen because it allows both variables to be measured objectively through standardized instruments, thereby converting students' perceptions into numerical data for statistical analysis. The use of a well-structured Likert-scale questionnaire ensured that each response was recorded consistently and reliably. In addition, descriptive and inferential analyses were applied to describe the general characteristics of the data and to test the strength and direction of the relationship between the research variables.

The participants of this study were tenth-grade students from several public senior high schools located in the regions of Serang, Tangerang, and South Tangerang in Banten Province. The total number of respondents was 153 students. A purposive sampling technique was employed to ensure that the participants were actively engaged in the learning process and possessed complete and verifiable academic records. This selective sampling was necessary to guarantee that the relationship between reward responses and learning outcomes was analyzed based on valid, relevant, and accountable data.

Data were collected through an online questionnaire distributed during class hours under the supervision of classroom teachers to maintain order and ensure proper completion of the forms by all participants. The research instrument consisted of eight statement items describing students' experiences related to the activation of the brain's reward system, such as feelings of being appreciated, emergence of joy, learning motivation, and the tendency to repeat positive behaviors. Each item was assessed using a four-point Likert scale, structured as follows.

Table 1. Research Instrument Specification

Variable	Indicator	Code	Scale	Description
Brain Reward System (X)	Feeling of appreciation	X1	Likert 1–4	Sense of being recognized or appreciated after achieving success
	Pleasure response	X2		Emotional enjoyment when receiving praise or positive feedback
	Increased motivation	X3		Greater drive to engage in learning after reinforcement is given
	Desire to repeat successful behavior	X4		Tendency to repeat actions that result in positive experiences
	Satisfaction with achievement	X5		Feeling of fulfillment after completing academic tasks
	Motivation from teacher feedback	X6		Motivation arising from teachers' positive comments
	Reward-based initiative	X7		Learning effort stimulated by the expectation or receipt of a reward
	Emotional readiness after reward	X8		Enhanced emotional readiness to learn following reinforcement
Learning Outcomes (Y)	Academic achievement	Y1	Interval (0–100)	Official semester grades from school documents

Table 2. Likert Scale for the Brain Reward System Variable (X)

Score	Description
1	Strongly Disagree
2	Disagree
3	Agree
4	Strongly Agree

The Brain Reward System variable (X) consisted of eight indicators designed to capture students' emotional and motivational responses to various forms of reinforcement, such as praise, recognition, and academic success. The instrument used a four-point Likert scale without a neutral option to encourage respondents to provide answers that most accurately reflected their experiences. Prior to its implementation in the main study, the questionnaire underwent expert validation and limited pilot testing to ensure that each item was easily understood, conceptually relevant, and truly representative of the reward system construct.

The Learning Outcome variable (Y) was derived from official academic scores, providing an objective representation of students' cognitive achievements. The use of formally documented grades minimized potential subjective biases commonly associated with self-reported data and enhanced reliability, as the scores were obtained through standardized school assessment procedures.

In this study, semester report grades were used as the primary indicator of learning outcomes, reflecting students' level of mastery across multiple subjects. These records were selected because they consistently represented academic competence and provided a defensible basis for evaluation. After data on reward responses and academic scores were collected, both variables were analyzed to determine whether higher levels of reward system activation were associated with better learning outcomes.

Data collection took place from May 24 to June 5, 2025. Before distributing the instruments, a comprehensive validation process was conducted, involving expert review and preliminary testing to ensure linguistic clarity, content relevance, and item consistency. The final instrument consisted of two key components: (1) the level of brain reward system activation, reflected in students' feelings of joy, motivation, and perceived appreciation when receiving reinforcement; and (2) learning outcomes obtained from official school records. Reliability testing using Cronbach's Alpha indicated that the reward system scale demonstrated excellent internal consistency.

The data analysis procedure involved both descriptive and correlational techniques. Descriptive analysis was used to present distribution patterns, frequencies, means, and percentages, providing an overview of the general characteristics of student responses. To examine the relationship between variables, the Pearson product–moment correlation technique was applied to assess the strength and direction of the association between the Brain Reward System (X) and Learning Outcomes (Y). This test was chosen because the data met the assumptions of linearity and were measured on an interval scale. A two-tailed significance level of $p \leq 0.05$ was used to determine the statistical significance of the relationships. All analyses were conducted using SPSS version 25 to ensure accuracy and consistency of the results.

4. RESEARCH RESULTS

Overall, the data indicate that the majority of students exhibited moderate to high levels of reward activation, particularly on indicators related to praise, recognition, and various forms of positive reinforcement. These components appeared to be the most dominant factors shaping students' emotional and motivational responses. This finding suggests that most students responded positively to forms of appreciation and external encouragement they received. In general, this pattern provides a quantitative basis for understanding how the Brain Reward System is activated, as summarized in Table 3.

Table 3. Descriptive Statistics for the Brain Reward System Variable

Statistic	Value
n	153
ΣX	3,596
Mean (X)	23.50
Standard Deviation (X)	6.87
Minimum	8
Maximum	40

The mean score of **23.50** with a standard deviation of **6.87** indicates that students' responses to various forms of reward generally

fell within the moderate category. The relatively wide score range—from a minimum of 8 to a maximum of 40 reflects a noticeable variation in the intensity of students' responses to reinforcement. This pattern implies that while most students reacted positively to praise or recognition, some demonstrated significantly higher or lower reward sensitivity. Such differences may stem from individual factors, specific learning contexts, or distinct motivational patterns that shape how each student interprets and internalizes forms of reinforcement.

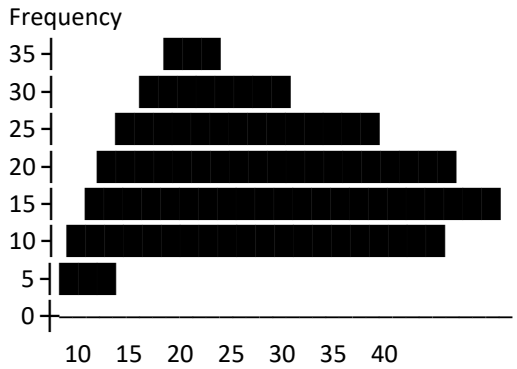


Figure 1. Distribution of Brain Reward System Scores

The histogram reveals a clear clustering of scores within the range of 18–32, indicating that most students exhibited moderate levels of reward responsiveness. This pattern suggests that for the majority of participants, various forms of reinforcement such as praise, recognition, and academic success fostered stable and balanced motivational drive without excess. Only a small number of respondents fell into the very low or very high score categories, meaning that minimal or excessively strong reward sensitivity was experienced by a minority of students.

Overall, this distribution aligns with findings from adolescent brain development research, which indicate that reward responses at this age typically occur at intermediate levels. Because adolescent brain structures, particularly those involved in motivation and dopaminergic systems, are still maturing, their reactions to reinforcement are generally non-extreme. Thus, the score distribution in the histogram supports the typical characteristics of reward processing in adolescents, characterized by moderate sensitivity.

Learning outcomes were evaluated using composite scores derived from various performance-based assessments. The descriptive statistics are presented in Table 4.

Table 4. Descriptive Statistics for Learning Outcomes (Y)

Statistic	Value
N	153
ΣY	9,633
Mean (Y)	62.96
Standard Deviation (Y)	22.02
Minimum	21
Maximum	98

The histogram shows a prominent concentration of scores in the range of 18 to 32, demonstrating that most participants had moderate reward responsiveness. This pattern indicates that the majority of students displayed relatively stable and proportional motivational reactions to reinforcement, whether in the form of praise, recognition, or academic success. Only a few students occupied extreme score ranges, so very low or very high reward sensitivity was limited to a small subset of respondents.

These findings are consistent with research on adolescent brain development, which typically shows reward responses at this age to be moderate. This relates to the ongoing maturation of neural systems, particularly areas regulating motivation and dopaminergic activity, resulting in more controlled and non-excessive reactions among adolescents. Accordingly, the histogram's score distribution aligns with patterns described in the literature and reinforces that moderate reward sensitivity is the most common characteristic among students of this age group.

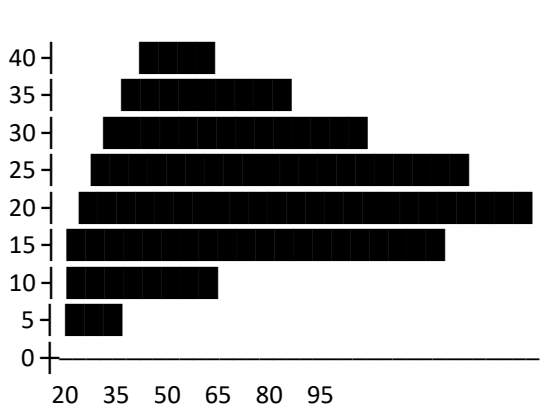


Figure 2. Distribution of Learning Outcomes Scores

The histogram reveals a clear clustering of scores within the range of 18–32, indicating that most students exhibited moderate levels of reward sensitivity. This pattern suggests that various forms of reinforcement—such as praise, recognition, and academic success tend to elicit stable and proportional motivational drive among the majority of participants. Only a small number of students fell at the extreme low or high score boundaries, meaning that very low or very high reward sensitivity was rare within this group.

Overall, this tendency aligns with findings from research on adolescent neurocognitive development, which frequently report that responses to rewarding stimuli are generally moderate during this developmental phase. Because neural systems associated with motivation and dopaminergic activity are still maturing, adolescents typically display controlled and non-excessive reactions to reinforcement. Thus, the distribution pattern observed in the histogram corresponds to well-established developmental characteristics and further reinforces that moderate reward sensitivity is the dominant tendency among students of this age.

Pearson product–moment correlation analysis was conducted to examine the relationship between the two variables. Table 5 presents a summary of the computational values used in this analysis.

Table 5. Summary of Correlation Computation Values

Component	Value
n	153
ΣX	3,596
ΣY	9,633
ΣX^2	680,229
ΣY^2	230,362
R	0.1719

The obtained correlation coefficient (r = 0.1719) indicates a weak yet positive and meaningful relationship between the variables. This finding suggests that students with higher reward system activation tend to exhibit slightly better learning outcomes, although the contribution is modest. Practically, experiences of receiving appreciation or certain forms of reinforcement appear linked to minor improvements in academic performance; however, reward mechanisms alone are not sufficiently robust to account for the full variation in students' learning outcomes.

The correlation value of r = 0.1719 confirms a positive but low association between the Brain Reward System and Learning Outcomes. The scatterplot in Figure 3 illustrates the linear relationship pattern between variables X and Y, supporting this interpretation.

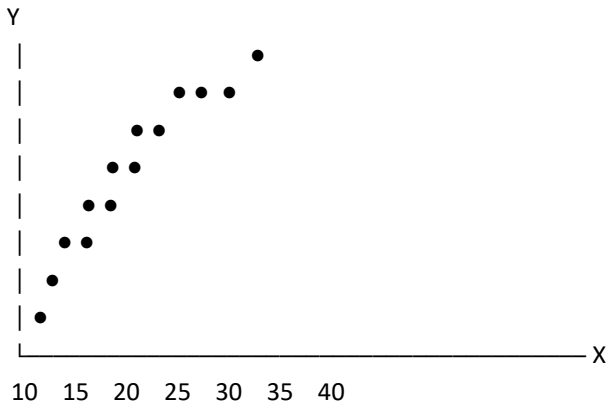


Figure 3. Scatterplot of the Relationship Between Brain Reward System and Learning Outcomes

The scatterplot reveals a slightly upward sloping regression line, indicating a weak positive relationship between the two variables. The relatively wide dispersion of data points highlights substantial variation among students, suggesting that while reward sensitivity plays a role in influencing learning outcomes, students with similar reward activation levels may still exhibit differing academic achievements. Thus, factors beyond the reward mechanism contribute significantly to variations in student performance.

The correlation significance test was conducted using the t-test formula, yielding the following results: t_calculated = 2.14; t_critical ($\alpha = 0.05$; df = 151) = 1.976. Since t_calculated > t_critical, the correlation is statistically significant ($p < 0.05$).

Table 6. Summary of t-Test for Correlation Significance

Component	Value
n	153
r	0.1719
df	151
t_calculated	2.14
t_critical	1.976
Sig.	Significant

Although the correlation strength is modest, its statistical significance confirms that the positive relationship between the Brain Reward System and Learning Outcomes is not due to chance. This underscores that various forms of reinforcement contribute meaningfully, albeit modestly, to academic achievement. In other words, reward responses serve as a consistent but non-dominant influence on learning performance, with measurable impacts from experiences like praise, recognition, or success.

The coefficient of determination is $R^2 = 0.0296$, meaning that 2.96% of the variance in Learning Outcomes is explained by the Brain Reward System.

Table 7. Coefficient of Determination

Component	Value
R^2	0.0296

This low R^2 value indicates that reward mechanisms account for only a limited portion of academic performance variance, with the remaining 97.04% attributable to other factors such as learning strategies, cognitive abilities, family support, emotional states, and study habits. The findings affirm that while rewards provide motivational boosts, they are insufficient as a standalone strategy for enhancing learning outcomes.

Research results indicate that the Brain Reward System exerts a statistically significant positive influence on students' learning outcomes, though the effect size remains modest. External reinforcements such as praise, recognition, and supportive feedback moderately enhance student motivation and engagement. However, the limited variance explained by reward mechanisms suggests they represent only one of multiple factors influencing academic success, with instructional quality, cognitive abilities, emotional conditions, and learning environment support likely exerting far greater impacts.

The positive correlation between the Brain Reward System and learning outcomes (r = 0.1719) demonstrates that students with

higher reward responsiveness tend to achieve slightly better academic performance. This implies that reinforcement experiences whether praise, recognition, or success stimulate motivational drive that modestly boosts learning results.

Significance testing confirms the correlation's statistical meaningfulness ($t_{calculated} = 2.14 > t_{critical} = 1.976$; $p < 0.05$), indicating the relationship is non-random. This aligns with neuroscience findings on dopaminergic pathway activation enhancing attention and learner engagement during instruction.

The coefficient of determination ($R^2 = 0.0296$) reveals that reward sensitivity accounts for just 2.96% of learning outcome variance, with approximately 97% attributable to other factors like thinking skills, learning approaches, family support, emotional stability, study habits, and teaching quality. This low value positions rewards as supplementary rather than primary determinants of success.

Descriptive data show moderate student reward responses (mean = 23.50), reflecting motivational benefits from teacher reinforcements without extreme intensity. This pattern matches adolescent developmental traits, where reward sensitivity remains balanced due to ongoing maturation of neural structures governing motivation and behavior control.

Overall, rewards serve as supplementary motivational triggers in learning processes. While their effects are tangible, they prove insufficient for substantial academic gains without comprehensive instructional strategies. In senior high school contexts, rewards remain essential for positive learning experiences but must integrate with pedagogies fostering intrinsic motivation, higher-order thinking, and long-term study habits.

5. CONCLUSION

This study demonstrates that the Brain Reward System exerts a positive influence on students' learning outcomes, although the effect size is relatively modest. Various forms of reinforcement such as praise, recognition, and other appreciations enhance learner motivation and promote engagement in instructional activities. These findings align with neuroscience literature, which posits that dopamine-mediated reward processes strengthen attention and sustain learning efforts.

Nevertheless, the low correlation coefficient indicates that the reward system is not the primary determinant of academic achievement. Student performance is also shaped by multiple factors, including emotional readiness, instructional quality, and interactions between family and school environments. This is consistent with motivation theories emphasizing that effective learning emerges from the interplay of intrinsic and extrinsic motivators. Overall, the research affirms that reward-based mechanisms serve a supportive role in the learning process, yet substantial and sustainable academic improvements depend on more comprehensive educational strategies.

REFERENCES

1) Ames, C. (2019). Classroom Motivation: Past Perspectives and Future Directions. *Educational Psychologist*, *54*(2), 61–67. https://doi.org/10.1080/00461520.2019.1654396
2) Anderson, L., & Krathwohl, D. (2001). *A Taxonomy for Learning, Teaching, and Assesing: A Revision of Bloom's Taxonomy of Educational Objectives*. Addison Wesley Longman. Inc.
3) Asrul, Ananda, R., & Rosnita. (2014). *Evaluasi Pembelajaran*. Citapustaka Media.
4) Deci, E. L., & Ryan, R. M. (2009). The "What" and "Why" of Goal Pursuits: Human Needs and the Self-Determination of Behavior. *Psychological Inquiry*, *11*(4), 227–268. https://doi.org/10.1207/S15327965PLI1104_01
5) Durlak, J. A., Weissberg, R. P., Dymnicki, A. B., Taylor, R. D., & Schellinger, K. B. (2011). The Impact of Enhancing Students' Social and Emotional Learning: A Meta-Analysis of School-Based Universal Interventions. *Child Development*, *82*(1), 405–432. https://doi.org/10.1111/j.1467-8624.2010.01564.x
6) Febriana, R. (2019). *Evaluasi Pembelajaran*. Bumi Aksara.
7) Jensen, E. (2008). *Teaching with the Brain in Mind (2nd ed.)*. ASCD.
8) Kim, Y. S. G., & Sheridan, S. M. (2020). Family School Partnerships and Child Development. *School Community Journal*, *30*(1), 305–322.
9) Ormrod, J., Anderman, E. M., & Anderman, L. H. (2020). *Educational Psychology: Developing Learners (10th ed.)*. Pearson.
10) Purves, D., Augustine, G. J., Fitzpatrick, D., Hall, W. C., LaMantia, A.-S., McNamara, J. O., & White, L. E. (2018). *Neuroscience (6th ed.)*. Sinauer Associates.
11) Raharjo, Louk, M. J. H., Widyastri, S., Suhra, S., Cahyono, H., & Laelasari, E. (2023). *Strategi Pembelajaran*. CV. Afasa Pustaka.
12) Santrock, J. W. (2019). *Life-span development* (17th ed). Mcgraw-Hill Education.
13) Schultz, W. (2016). Dopamine Reward Prediction-Error Signalling: A Two-Component Response. *Nature Reviews Neuroscience*, *17*(3), 183–195. https://doi.org/10.1038/nrn.2015.26

14) Schunk, D. H. (2020). *Learning Theories: An Educational Perspective (8th ed.)*. Pearson Education.
15) Slavin, R. E. (2018). *Educational Psychology: Theory and Practice (13th ed.)*. Pearson.
16) Sousa, D. A. (2017). *How the Brain Learns (5th ed.)*. Corwin Press.

There is an Open Access article, distributed under the term of the Creative Commons Attribution – Non Commercial 4.0 International (CC BY-NC 4.0) (https://creativecommons.org/licenses/by-nc/4.0/), which permits remixing, adapting and building upon the work for non-commercial use, provided the original work is properly cited.