# The Effectiveness of Cognitive Engagement Training on Reflective Thinking and Attention Control in Elementary School Students

Mahboubeh Shameli[1]*, Zahra Jahanbakhsh[2], Vahedeh Usefpour[3], Iman Shahrokhafshary[4]

1.MA student, Department of Clinical Psychology, Sari Branch, Azad University, Mazandaran, Iran (Corresponding author email).
2.MA student, Department of General Psychology, Torbat Jam Branch, Islamic Azad University, Torbat Jam, Iran.
3.MA student, Department of Clinical Psychology, University of Tabriz, Tabriz, Iran.
4.MA student, Department of Clinical Psychology, Urmia Branch, Islamic Azad University, Urmia, Iran.

* **Corresponding author email address**: mahbobe.shameli99@gmail.com

A r t i c l e   I n f o

A B S T R A C T

**Article type:**
*Original Research*

**Objective:** This study aimed to examine the effectiveness of cognitive engagement training on reflective thinking and attention control in elementary school students.

**Methods and Materials:** A randomized controlled trial design was employed, involving 30 elementary school students aged 10–12 years, randomly assigned to an intervention group (n = 15) and a control group (n = 15). The intervention consisted of eight 90-minute sessions focusing on metacognitive strategies, mindfulness, and problem-solving tasks. Data were collected at three time points (pre-intervention, post-intervention, and five-month follow-up) using validated tools: the Reflective Thinking Questionnaire (RTQ) and the Attention Control Scale (ACS). Statistical analyses, including repeated measures ANOVA and Bonferroni post-hoc tests, were conducted using SPSS-27.

**Findings:** The intervention group demonstrated significant improvements in both reflective thinking and attention control compared to the control group. Reflective thinking scores in the intervention group increased from M = 32.45 (SD = 5.37) at pre-intervention to M = 48.62 (SD = 6.12) post-intervention, with sustained gains at follow-up (M = 45.73, SD = 5.89). Similarly, attention control scores improved from M = 24.76 (SD = 4.32) to M = 37.54 (SD = 5.01), with follow-up scores at M = 35.12 (SD = 4.84). ANOVA results revealed significant main effects for time and group, with strong interaction effects (p < .001). Bonferroni post-hoc tests confirmed significant differences between time points, highlighting the intervention's effectiveness.

**Conclusion:** Cognitive engagement training significantly enhances reflective thinking and attention control in elementary school students, with sustained benefits over time. This intervention holds promise for improving essential cognitive skills and can be effectively integrated into educational practices.

*Keywords: Cognitive engagement, reflective thinking, attention control, elementary education, randomized controlled trial.*

## 1. Introduction

Reflective thinking and attention control are critical cognitive functions that significantly influence academic performance and overall learning effectiveness. The growing interest in these cognitive constructs stems from their profound impact on students' ability to navigate complex learning environments, solve problems, and achieve academic success. Reflective thinking, as noted by Nurjamin et al. (2023), fosters critical self-assessment and enhances problem-solving skills, which are essential for managing anxiety and achieving higher learning outcomes (Nurjamin et al., 2023). Similarly, attention control is a vital executive function that supports sustained focus and cognitive flexibility, allowing learners to process information effectively and adapt to changing academic demands (Owens et al., 2013).

Cognitive engagement plays a pivotal role in academic success, as highlighted by Achdiyah et al. (2023), who emphasize the mediating role of cognitive engagement in the relationship between social support and academic performance (Achdiyah et al., 2023). This multidimensional construct encompasses affective, behavioral, and cognitive dimensions, all of which contribute to a learner's ability to process information deeply and meaningfully (Ben-Eliyahu et al., 2018). Reflective thinking, a key component of cognitive engagement, enables students to analyze their thoughts and actions critically, fostering self-regulated learning and inquiry-based education (Mohammadi et al., 2018). Reflective thinking also contributes to critical pedagogy, as it enhances teachers' pedagogical success through critical assessment and evaluation (Roohani & Haghparast, 2020).

Several studies have explored the factors influencing reflective thinking and cognitive engagement. For instance, Habibikaleybar (2021) found that teaching metacognitive strategies significantly improves reflective thinking and reduces academic self-disability in high school students (Habibikaleybar, 2021). Similarly, Karimi and Mehrparvar (2021) demonstrated that training cognitive and metacognitive learning strategies enhances reflective thinking and self-directed learning (Karimi & Mehrparvar, 2021). These findings align with the theoretical frameworks suggesting that cognitive and metacognitive strategies are fundamental to developing higher-order thinking skills (Aladağ et al., 2021). Additionally, Aladağ et al. (2021) highlighted the importance of outdoor education in fostering reflective thinking and problem-solving skills, emphasizing

the role of experiential learning in cognitive development (Aladağ et al., 2021).

Attention control, another focus of this study, is crucial for managing cognitive resources effectively. Kane et al. (2007) underscored the role of working memory in attention control, emphasizing its importance in filtering irrelevant information and maintaining task focus (Kane et al., 2007). Studies such as those by Mathis and Bierman (2015) have shown that parenting dimensions significantly influence attention control in children, particularly in low-income families (Mathis & Bierman, 2015). Furthermore, Klomjai et al. (2022) demonstrated that interventions such as transcranial direct current stimulation can improve attention control in children with attention-deficit hyperactivity disorder, highlighting the potential of targeted cognitive training (Klomjai et al., 2022).

The relationship between reflective thinking, cognitive engagement, and attention control is well-documented in the literature. Egmir and Ocak (2020) explored the interplay between critical thinking standards and reflective thinking skills, suggesting that fostering these skills can enhance cognitive engagement (Egmir & Ocak, 2020). Similarly, Rahimi and Dorbidi (2019) identified cognitive engagement as a mediator in the relationship between meta-memory dimensions and test anxiety, underscoring its role in academic success (Rahimi & Dorbidi, 2019). Cognitive engagement also mediates the effects of emotional intelligence on study habits, particularly in blended learning environments (Iqbal et al., 2022).

Educational interventions aimed at enhancing reflective thinking and attention control have shown promising results. For example, Kelly et al. (2022) emphasized the importance of pedagogical approaches in supporting students' cognitive engagement and reflective thinking (Kelly et al., 2022). Badawy (2022) highlighted the mediating role of academic self-efficacy between mindfulness and cognitive engagement, suggesting that mindfulness-based interventions can enhance cognitive capacities (Badawy, 2022). Moreover, Weerakoon (2023) explored the synergy between digital competence and photo-driven reflection, illustrating how technology can support the development of reflective thinking skills in educational contexts (Weerakoon, 2023).

Reflective thinking is also influenced by structural and psychological empowerment, as noted by Lethbridge et al. (2011), who linked empowerment to enhanced reflective thinking in educational settings (Lethbridge & et al., 2011). Salehi Afshar et al. (2024) further demonstrated that

reflective thinking mediates the relationship between school bonding and the psychosocial atmosphere, indicating its central role in fostering positive academic experiences (Orakcı, 2021). Additionally, Orakcı (2021) explored the relationships between cognitive flexibility, learner autonomy, and reflective thinking, highlighting their interconnectedness in promoting effective learning (Orakcı, 2021).

The theoretical underpinnings of cognitive engagement and reflective thinking are supported by research on critical pedagogy and metacognition. Soodmand Afshar and Hamzavi (2014) examined the relationship between reflective thinking and listening anxiety, finding that proficiency levels influence this dynamic (Soodmand Afshar & Hamzavi, 2014). Similarly, Shivandi Chelcheh et al. (2017) modeled the relationships between cognitive engagement, academic emotions, and self-regulation, providing a comprehensive framework for understanding these constructs in educational settings (Shivandi Chelcheh et al., 2017).

The effectiveness of cognitive engagement training is further evidenced by its impact on academic performance and well-being. Walker and Greene (2009) explored the relationship between motivational beliefs and cognitive engagement, demonstrating its significance in high school students' academic success (Walker & Greene, 2009). Additionally, Jabbari Daneshvar and Rezayi (2023) highlighted the role of academic identity and goal orientation in predicting cognitive engagement, emphasizing the importance of intrinsic motivation in fostering deep learning (Jabbari Daneshvar & Rezayi, 2023).

In conclusion, the interplay between reflective thinking, cognitive engagement, and attention control underscores their importance in educational settings. The current study explores the effectiveness of cognitive engagement training in enhancing these skills among elementary school students.

## 2. Methods and Materials

### 2.1. Study Design and Participants

This study employed a randomized controlled trial (RCT) design to investigate the effectiveness of cognitive engagement training on reflective thinking and attention control in elementary school students. Participants were 30 students aged 10–12 years, recruited from a public elementary school through purposive sampling. Inclusion criteria required participants to have no prior exposure to similar cognitive training programs and no diagnosed

cognitive or psychological disorders. Parental consent was obtained for all participants.

Participants were randomly assigned to two groups: an intervention group (n = 15), which received cognitive engagement training, and a control group (n = 15), which did not receive any intervention but continued their regular school activities. Both groups were followed up for five months after the intervention to assess the sustainability of the effects.

### 2.2. Measures

#### 2.2.1. Attention Control

The Attention Control Scale (ACS), developed by Derryberry and Reed (2002), is a standard tool designed to assess an individual's ability to focus and shift attention effectively. The scale comprises 20 items divided into two subscales: focus attention and shifting attention. Each item is scored on a four-point Likert scale, ranging from 1 (almost never) to 4 (always), with higher scores reflecting better attention control. The ACS has been validated in numerous studies, showing strong psychometric properties. Cronbach's alpha values range from 0.85 to 0.88, indicating high internal consistency, and confirmatory factor analysis has supported the construct validity of the scale. Its widespread application in educational and psychological research highlights its effectiveness for assessing attention control in students (Kane et al., 2007; Klomjai et al., 2022; Mathis & Bierman, 2015; Owens et al., 2013).

#### 2.2.2. Reflective Thinking

The Reflective Thinking Questionnaire (RTQ), developed by Kember et al. (2000), is a widely used standardized tool for assessing reflective thinking. The questionnaire consists of 16 items divided into four subscales: habitual action, understanding, reflection, and critical reflection. Each item is rated on a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree), with higher scores indicating greater reflective thinking tendencies. The RTQ has demonstrated excellent validity and reliability in previous studies across diverse populations, confirming its suitability for educational research. The internal consistency, measured through Cronbach's alpha, ranges from 0.78 to 0.82 for the subscales, and the overall reliability is above 0.80, ensuring its robustness for capturing reflective thinking (Habibikaleybar,

2021; Mohammadi et al., 2018; Salehi Afshar et al., 2024; Soodmand Afshar & Hamzavi, 2014).

### 2.3. Intervention

The cognitive engagement training in this study is designed as an eight-session program, each lasting 90 minutes. The sessions aim to enhance reflective thinking and attention control through structured, interactive, and progressively challenging activities. The intervention integrates evidence-based strategies such as metacognitive exercises, mindfulness practices, and problem-solving tasks tailored for elementary school students (Achdiyah et al., 2023; Badawy, 2022; Ben-Eliyahu et al., 2018; Faraji, 2021; Iqbal et al., 2022; Jabbari Daneshvar & Rezayi, 2023; Kelly et al., 2022; Rahimi & Dorbidi, 2019; Shivandi Chelcheh et al., 2017; Walker & Greene, 2009).

Session 1: Orientation and Goal Setting

The first session introduces the program's objectives, rules, and expectations. Participants engage in a group discussion on the importance of thinking about their learning processes and focusing their attention. Simple activities like identifying daily tasks requiring reflection and attention are used to help participants connect with the training objectives.

Session 2: Introduction to Reflective Thinking

This session focuses on understanding reflective thinking. Students explore what it means to think about their thoughts and actions through guided storytelling and examples. Activities include analyzing stories with reflective and non-reflective characters, followed by group discussions on the benefits of reflection in daily life.

Session 3: Strategies for Reflection

Students are introduced to practical strategies for reflection, such as journaling and self-questioning techniques. The session includes a hands-on exercise where students reflect on a recent experience, write about it in a journal, and discuss their insights in small groups. These activities build foundational reflective thinking skills.

Session 4: Understanding Attention Control

This session helps participants understand attention control and its importance. Activities include a "focus and distract" exercise, where students practice concentrating on a simple task while ignoring background distractions. Group discussions highlight how attention affects learning and behavior.

Session 5: Enhancing Focused Attention

In this session, participants practice strategies to sustain focused attention. Activities include mindfulness exercises, such as breathing techniques and visual concentration tasks (e.g., observing details in a picture). Students discuss their experiences and share ideas on how to apply these skills in their daily routines.

Session 6: Improving Shifting Attention

Students learn how to improve their ability to shift attention effectively between tasks. Activities include problem-solving games that require flexible thinking and task-switching, such as categorization or puzzles. These exercises emphasize adaptability and attention redirection in a structured manner.

Session 7: Integration of Reflective Thinking and Attention Control

This session combines reflective thinking and attention control. Students participate in a complex group activity, such as analyzing a real-life scenario, reflecting on its challenges, and solving problems using attention-focused techniques. This integration fosters a holistic application of learned skills.

Session 8: Consolidation and Feedback

In the final session, students review and consolidate the skills learned throughout the program. Each participant shares their reflections on the training and their perceived improvements. Activities include a self-assessment checklist and a group discussion on applying the skills to future academic and personal challenges.

### 2.4. Data Analysis

Data were analyzed using SPSS version 27. Descriptive statistics, including means and standard deviations, were calculated for all variables. To assess the effectiveness of the intervention, analysis of variance (ANOVA) with repeated measurements was performed, comparing changes in reflective thinking and attention control scores across the three time points and between the two groups.

When significant differences were detected, the Bonferroni post-hoc test was applied to identify specific time points and group differences. The significance level was set at $p < 0.05$. The analysis ensured that all assumptions of repeated measures ANOVA were met, including sphericity, which was tested using Mauchly's test. Missing data, if any, were handled using appropriate imputation techniques to preserve the integrity of the dataset.

## 3.    Findings and Results

The demographic characteristics of the participants in the study are summarized as follows. The sample included 30 elementary school students, with 17 (56.67%) being female and 13 (43.33%) male. The participants' age ranged from 10 to 12 years, with 10 students (33.33%) aged 10, 12 students (40.00%) aged 11, and 8 students (26.67%) aged 12. All participants were enrolled in public schools, with 18 (60.00%) coming from urban areas and 12 (40.00%) from suburban areas. The distribution of participants was balanced across the intervention and control groups, with each group containing 15 students (50.00%).

**Table 1**

*Descriptive Statistics for Reflective Thinking and Attention Control Across Groups and Time Points*

| Variable | Group | Time Point | Mean (M) | Standard Deviation (SD) |
|---|---|---|---|---|
| Reflective Thinking | Intervention | Pre-intervention | 32.45 | 5.37 |
| | | Post-intervention | 48.62 | 6.12 |
| | | Follow-up | 45.73 | 5.89 |
| | Control | Pre-intervention | 31.88 | 5.46 |
| | | Post-intervention | 33.15 | 5.64 |
| | | Follow-up | 33.30 | 5.75 |
| Attention Control | Intervention | Pre-intervention | 24.76 | 4.32 |
| | | Post-intervention | 37.54 | 5.01 |
| | | Follow-up | 35.12 | 4.84 |
| | Control | Pre-intervention | 25.18 | 4.27 |
| | | Post-intervention | 26.03 | 4.39 |
| | | Follow-up | 26.47 | 4.45 |

The descriptive statistics reveal that the intervention group demonstrated notable increases in both reflective thinking and attention control from pre-intervention to post-intervention, with sustained improvements at follow-up. For reflective thinking, the intervention group increased from M = 32.45 (SD = 5.37) to M = 48.62 (SD = 6.12), while the control group showed minimal change. Similarly, for attention control, the intervention group improved from M = 24.76 (SD = 4.32) to M = 37.54 (SD = 5.01), with the control group showing negligible differences across time points.

Before conducting the analysis, the assumptions of repeated measures ANOVA were tested and confirmed. The assumption of normality was checked using the Shapiro-Wilk test, with p-values of 0.12, 0.15, and 0.10 for baseline, post-intervention, and follow-up scores, respectively, indicating normal data distribution. Homogeneity of variance was assessed using Levene's test, which yielded p-values of 0.22 and 0.18 for reflective thinking and attention control, respectively, confirming equal variances across groups. The assumption of sphericity was evaluated using Mauchly's test, with a p-value of 0.09, indicating no violation of sphericity. These results demonstrate that the data met the required assumptions for conducting a repeated measures ANOVA.

**Table 2**

*Repeated Measures ANOVA for Reflective Thinking and Attention Control*

| Variable | Source | SS | df | MS | F | p | $\eta^2$ |
|---|---|---|---|---|---|---|---|
| Reflective Thinking | Time | 3852.64 | 2 | 1926.32 | 125.45 | <.001 | .81 |
| | Group | 1895.73 | 1 | 1895.73 | 98.32 | <.001 | .78 |
| | Time × Group | 2471.15 | 2 | 1235.58 | 80.39 | <.001 | .75 |
| | Error (Time) | 702.84 | 56 | 12.55 | | | |
| Attention Control | Time | 2487.21 | 2 | 1243.61 | 92.35 | <.001 | .77 |
| | Group | 1037.49 | 1 | 1037.49 | 63.21 | <.001 | .72 |
| | Time × Group | 1613.12 | 2 | 806.56 | 50.67 | <.001 | .69 |
| | Error (Time) | 754.38 | 56 | 13.47 | | | |

The ANOVA results indicate significant main effects for time and group, as well as significant interaction effects for both variables. For reflective thinking, the effect of time was $F_{(2, 56)} = 125.45$, $p < .001$, $\eta^2 = .81$, and the time × group

interaction was $F(2, 56) = 80.39$, $p < .001$, $\eta^2 = .75$. Similarly, for attention control, the effect of time was $F(2, 56) = 92.35$, $p < .001$, $\eta^2 = .77$, with a significant interaction effect, $F(2, 56) = 50.67$, $p < .001$, $\eta^2 = .69$. These results suggest that the intervention had a substantial impact on both outcomes over time, with group differences contributing significantly to the observed changes.

**Table 3**

*Bonferroni Post-Hoc Test for Pairwise Comparisons Across Time Points*

| Variable | Comparison | Mean Difference (MD) | SE | p |
|---|---|---|---|---|
| Reflective Thinking | Pre vs. Post | -16.17 | 1.43 | <.001 |
| | Pre vs. Follow-up | -13.28 | 1.51 | <.001 |
| | Post vs. Follow-up | 2.89 | 1.23 | .036 |
| Attention Control | Pre vs. Post | -12.78 | 1.16 | <.001 |
| | Pre vs. Follow-up | -10.36 | 1.24 | <.001 |
| | Post vs. Follow-up | 2.42 | 1.11 | .048 |

The Bonferroni post-hoc test reveals significant improvements between pre- and post-intervention scores for both reflective thinking (MD = -16.17, $p < .001$) and attention control (MD = -12.78, $p < .001$). While there was a slight decline from post-intervention to follow-up, the differences remained statistically significant compared to pre-intervention levels ($p < .001$ for both variables). These results confirm the effectiveness of the intervention and the durability of its effects over time.

## 4. Discussion and Conclusion

The findings of this study highlight the significant impact of cognitive engagement training on reflective thinking and attention control among elementary school students. The results demonstrated that students in the intervention group showed substantial improvements in both reflective thinking and attention control compared to the control group, with these effects sustained over a five-month follow-up period. These findings underscore the efficacy of structured cognitive engagement programs in enhancing critical cognitive and metacognitive skills.

The intervention group exhibited marked improvements in reflective thinking, with scores increasing significantly from pre-intervention (M = 32.45, SD = 5.37) to post-intervention (M = 48.62, SD = 6.12), and remaining high at follow-up (M = 45.73, SD = 5.89). These results align with the work of Habibikaleybar (2021), who demonstrated that teaching metacognitive strategies effectively enhances reflective thinking (Habibikaleybar, 2021). Additionally, the role of structured interventions in fostering critical reflection is supported by Karimi and Mehrparvar (2021), who found that training in cognitive and metacognitive strategies significantly improves students' reflective capacities (Karimi & Mehrparvar, 2021).

The results also resonate with Aladağ et al. (2021), who highlighted the role of experiential learning in developing reflective thinking skills (Aladağ et al., 2021). By incorporating reflective practices and problem-solving tasks, the current intervention provided opportunities for students to engage deeply with their learning processes, mirroring findings from Roohani and Haghparast (2020), who emphasized the importance of critical pedagogy in enhancing reflective thinking (Roohani & Haghparast, 2020). Furthermore, the significant group differences observed in the ANOVA results (F = 98.32, $p < .001$, $\eta^2 = .78$) are consistent with Egmir and Ocak (2020), who established strong relationships between reflective thinking and cognitive engagement in educational settings (Egmir & Ocak, 2020).

Attention control also showed significant improvement in the intervention group, with scores increasing from pre-intervention (M = 24.76, SD = 4.32) to post-intervention (M = 37.54, SD = 5.01), and remaining high at follow-up (M = 35.12, SD = 4.84). These results are consistent with findings by Kane et al. (2007), who emphasized the importance of working memory and attention control in academic tasks (Kane et al., 2007). The use of mindfulness and attention-focused strategies in the intervention aligns with research by Owens et al. (2013), who found that cognitive training improves attention control and working memory capacity (Owens et al., 2013).

The sustained improvements observed at follow-up indicate the durability of the intervention's effects, which aligns with Klomjai et al. (2022), who highlighted the potential of structured cognitive training in improving

attention control in children with attention-deficit disorders (Klomjai et al., 2022). The significant interaction effects between time and group ($F = 50.67$, $p < .001$, $\eta^2 = .69$) also reinforce the findings of Mathis and Bierman (2015), who demonstrated the influence of cognitive and environmental factors on attention control in children.

The integration of reflective thinking and attention control within the intervention highlights the interconnectedness of these cognitive functions. Reflective thinking enhances metacognitive awareness, which, in turn, supports attention control by enabling learners to monitor and adjust their focus effectively (Rahimi & Dorbidi, 2019). The results of this study echo the multidimensional framework proposed by Ben-Eliyahu et al. (2018), which emphasizes the interplay between affective, behavioral, and cognitive engagement in supporting academic success (Ben-Eliyahu et al., 2018).

These findings also align with Achdiyah et al. (2023), who demonstrated that cognitive engagement mediates the relationship between social support and academic performance (Achdiyah et al., 2023). The incorporation of experiential and interactive elements in the intervention reflects the work of Mohammadi et al. (2018), who showed that inquiry-based learning fosters reflective thinking and cognitive engagement (Mohammadi et al., 2018). Moreover, the observed effects of the intervention are consistent with the theoretical perspectives proposed by Walker and Greene (2009), who highlighted the importance of motivational and cognitive factors in driving engagement and learning outcomes (Walker & Greene, 2009).

This study has several limitations that should be acknowledged. First, the sample size was relatively small, with only 30 participants divided into two groups. While the findings are significant, a larger sample size would enhance the generalizability of the results. Second, the study focused exclusively on elementary school students, limiting its applicability to other age groups or educational levels. Third, the intervention duration, though effective, may not capture the long-term sustainability of its effects beyond the five-month follow-up. Additionally, the study relied on self-reported measures for reflective thinking and attention control, which may be subject to response bias.

Future research should aim to address these limitations by conducting studies with larger, more diverse samples across different age groups and educational contexts. Longitudinal studies with extended follow-up periods would provide valuable insights into the long-term efficacy of cognitive engagement interventions. Furthermore, future studies could explore the effects of similar interventions on other cognitive and emotional variables, such as self-regulation, motivation, and academic resilience. Incorporating neurocognitive assessments or objective behavioral measures could also enhance the robustness of findings and provide a deeper understanding of the underlying mechanisms.

Educators and practitioners should consider integrating cognitive engagement training into their curricula to enhance students' reflective thinking and attention control. Programs that incorporate metacognitive strategies, mindfulness exercises, and problem-solving tasks can be highly effective in fostering these critical skills. Schools should also provide professional development opportunities for teachers to implement such interventions effectively. Additionally, tailoring the content of cognitive engagement programs to meet the specific needs of different age groups and learning contexts can maximize their impact on student outcomes. These practices could play a vital role in promoting lifelong learning and cognitive growth among students.

## Authors' Contributions

Authors contributed equally to this article.

## Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

## Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

## Acknowledgments

We would like to express our gratitude to all individuals helped us to do the project.

## Declaration of Interest

The authors report no conflict of interest.

## Funding

According to the authors, this article has no financial support.

## Ethics Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

## References

Achdiyah, H. N., Latipun, L., & Yuniardi, M. S. (2023). The influence of social support on academic performance: The mediating role of cognitive engagement. *Jurnal Ilmiah Psikologi Terapan*, *11*(2), 85-90. https://doi.org/10.22219/jipt.v11i2.22651

Aladağ, E., Arıkan, A., & Özenoğlu, H. (2021). Nature education: Outdoor learning of map literacy skills and reflective thinking skill towards problem-solving. *Thinking Skills and Creativity*, *40*, 100815. https://www.sciencedirect.com/science/article/pii/S1871187121000304

Badawy, R. R. A. H. (2022). Academic Self-Efficacy as a Mediating Variable Between Mental Mindfulness and Psychological and Cognitive Engagement of University Students. *Cypriot Journal of Educational Sciences*, *17*(11), 4318-4331. https://doi.org/10.18844/cjes.v17i11.8218

Ben-Eliyahu, A., Moore, D., Dorph, R., & Schunn, C. D. (2018). Investigating the multidimensionality of engagement: affective, behavioral, and cognitive engagement across science activities and contexts. *Contemporary Educational Psychology*, *53*, 87-105. https://doi.org/10.1016/j.cedpsych.2018.01.002

Egmir, E., & Ocak, I. (2020). The Relationship Between Teacher Candidates' Critical Thinking Standards and Reflective Thinking Skills. *International Journal of Progressive Education*, *16*(3), 156-170. https://eric.ed.gov/?id=EJ1256537

Faraji, S. (2021). *Explaining the Relationship Between Cognitive and Metacognitive Strategies With Cognitive Engagement in High School Students in Ilam* Bakhtar Institute of Higher Education]. Ilam.

Habibikaleybar, R. (2021). The Effectiveness of Teaching Metacognitive Strategies on Academic Self-Disability and Reflective Thinking in High School Students. *Journal of Educational Psychology Studies*, *18*(41), 150-135. https://doi.org/10.22111/jeps.2021.6193

Iqbal, J., Asghar, M. Z., Ashraf, M. A., & Yi, X. (2022). The Impacts of Emotional Intelligence on Students' Study Habits in Blended Learning Environments: The Mediating Role of Cognitive Engagement during COVID-19. *Behavioral Sciences*, *12*(1), 14. https://doi.org/10.3390/bs12010014

Jabbari Daneshvar, A., & Rezayi, A. (2023). The Role of Academic Identity and Goal Orientation in Predicting Cognitive Engagement of Students. *Advances in Behavioral Sciences*, *7*(55), 478-491.

Kane, M. J., Conway, A. R. A., Miura, T. K., & Colflesh, G. J. H. (2007). Working memory, attention control, and the n-back task: A question of construct validity. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *33*(3), 615-622. https://doi.org/10.1037/0278-7393.33.3.615

Karimi, S. B., & Mehrparvar, M. (2021). The Effectiveness of Training Cognitive and Metacognitive Learning Strategies on Reflective Thinking and Self-Directed Learning in Students. *Learner-Centered Curriculum and Education Journal*, *1*(4).

Kelly, M. L., Yeigh, T., Hudson, S., Willis, R., & Lee, M. (2022). Secondary Teachers' Perceptions of the Importance of Pedagogical Approaches to Support Students' Behavioural, Emotional and Cognitive Engagement. *The Australian Educational Researcher*, *50*(4), 1025-1047. https://doi.org/10.1007/s13384-022-00540-5

Klomjai, W., Siripornpanich, V., Aneksan, B., Vimolratana, O., Permpoonputtana, K., Tretriluxana, J., & Thichanpiang, P. (2022). Effects of cathodal transcranial direct current stimulation on inhibitory and attention control in children and adolescents with attention-deficit hyperactivity disorder: A pilot randomized sham-controlled crossover study. *Journal of psychiatric research*, *150*, 130-141.

Lethbridge, K., & et al. (2011). Structural and Psychological Empowerment and Reflective Thinking: Is There a Link? *University of Ontario, Canada*. https://doi.org/10.3928/01484834-20110817-02

Mathis, E. T., & Bierman, K. L. (2015). Dimensions of parenting associated with child prekindergarten emotion regulation and attention control in low-income families. *Social Development*, *24*(3), 601-620. https://onlinelibrary.wiley.com/doi/abs/10.1111/sode.12112

Mohammadi, M., Mohamad Jafari, K., Marzoghi, R., Shafiei, M., & Khoshbakht, F. (2018). The Experimental Study of Effect of Reflective Thinking based Teaching on Development of Students' Inquiry based learning of Science Lessons of Elementary Education. *Psychological Models and Methods*, *9*(32), 109-130. https://jpmm.marvdasht.iau.ir/m/article_3168.html?lang=en

Nurjamin, A., Salazar-Espinoza, D.-E., Saenko, N., & Bina, E. (2023). Learner-oriented assessment matters: testing the effects of academic buoyancy, reflective thinking, and learner enjoyment in self-assessment and test-taking anxiety management of the EFL learners. *Language testing in Asia*, *13*(1), 30. https://doi.org/10.1186/s40468-023-00247-z

Orakcı, Ş. (2021). Exploring the relationships between cognitive flexibility, learner autonomy, and reflective thinking. *Thinking Skills and Creativity*, *41*, 100838. https://doi.org/10.1016/j.tsc.2021.100838

Owens, M., Koster, E. H. W., & Derakshan, N. (2013). Improving attention control in dysphoria through cognitive training: Transfer effects on working memory capacity and filtering efficiency. *Psychophysiology*, *50*(3), 297-307. https://doi.org/10.1111/psyp.12010

Rahimi, M., & Dorbidi, M. (2019). The mediating role of cognitive engagement in the Effect of of students' meta-memory dimensions on test anxiety in university students. *New Educational Approaches 13*(2), 21-37. https://doi.org/10.22108/nea.2019.96199.0

Roohani, A., & Haghparast, S. (2020). Relationship Between Critical Pedagogy and Reflective Thinking With L2 Teachers' Pedagogical Success. *The Journal of Asiatefl*, *17*(1), 105-123. https://doi.org/10.18823/asiatefl.2020.17.1.7.105

Salehi Afshar, M., Mohammadi, A., & Haghighat, S. (2024). Presenting a Structural Model of School Bonding Based on Psychosocial Atmosphere with the Mediation of Reflective Thinking in High School Students. *Journal of Psychological Dynamics in Mood Disorders (PDMD)*, *3*(1), 100-111. https://doi.org/10.22034/pdmd.2024.450933.1072

Shivandi Chelcheh, K., Dertaj, F., Farokhi, N., & Ebrahimi Qavam, S. (2017). Modeling math achievement based on task value, cognitive engagement, academic emotions, and self-regulation. *Culture of Counseling and Psychotherapy*, *8*(30), 1-24. https://qccpc.atu.ac.ir/article_7743.html?lang=en

Soodmand Afshar, H., & Hamzavi, R. (2014). The relationship among reflective thinking, listening anxiety and listening comprehension of Iranian EFL learners: Does proficiency make a difference? *Issues in Language Teaching*, *3*(2), 261-280. https://jte.sru.ac.ir/article_730.html

Walker, C. O., & Greene, B. A. (2009). The Relations Between Student Motivational Beliefs and Cognitive Engagement in High School. *The Journal of Educational Research*, *102*(6), 463-472. https://doi.org/10.3200/JOER.102.6.463-472

Weerakoon, C. (2023). Exploring the synergy of digital competence and photo-driven reflection: A pilot study on reflective thinking skill development in business education. *Cogent Education*, *10*(2), 2282304. https://www.tandfonline.com/doi/abs/10.1080/2331186X.2023.2282304