The Effect of Philosophy for Children (P4C) Program on Working Memory and Frustration Tolerance in Sixth-Grade Students

Jamshid. Shahini kevesk[1] , Alireza. Maredpour[2*] , Armin. Mahmoudi [2]

[1] Department of Educational Science and Psychology, Yas.C., Islamic Azad University, Yasuj, Iran
[2] Department of Psychology, Yas.C., Islamic Azad University, Yasuj, Iran

* **Corresponding author email address**: maredpour@iau.ir

A r t i c l e I n f o

A B S T R A C T

Purpose: This study aimed to investigate the impact of the Philosophy for Children (P4C) program on working memory and frustration tolerance in sixth-grade elementary students.

Methods and Materials: The study employed a quasi-experimental design with a pre-test, post-test, and one-month follow-up, including an experimental group (n = 25) and a control group (n = 25). Participants were selected using single-stage cluster random sampling from sixth-grade male students in Yasuj, Iran. The experimental group received 12 sessions of P4C intervention over six weeks, while the control group received no intervention. Data were collected using validated questionnaires for working memory and frustration tolerance. Statistical analyses included repeated measures ANOVA and Bonferroni post-hoc tests, conducted using SPSS 26.

Findings: The results indicated a significant interaction effect between time and group for working memory ($F(1.939, 93.095) = 97.203$, $p < 0.001$, $\eta^2 = 0.669$) and frustration tolerance ($F(1.457, 69.941) = 254.106$, $p < 0.001$, $\eta^2 = 0.841$). Post-hoc comparisons revealed significant improvements in working memory scores in the experimental group from pre-test to post-test ($p < 0.001$) and pre-test to follow-up ($p < 0.001$). Frustration tolerance scores in the experimental group significantly decreased from pre-test to post-test ($p < 0.001$) and pre-test to follow-up ($p < 0.001$). No significant changes were observed in the control group.

Conclusion: The findings demonstrate that the P4C program significantly enhances working memory and reduces frustration tolerance in elementary students. These results highlight the program's effectiveness in promoting cognitive and emotional development, underscoring its potential as a valuable educational intervention. Future research should explore long-term impacts and broader applications of P4C in diverse educational contexts.

Keywords: Philosophy for Children, Working Memory, Frustration Tolerance, Cognitive Development, Emotional Regulation, Educational Intervention.

1.   Introduction

Working memory is a fundamental component of executive functions that enables individuals to temporarily hold and manipulate information for cognitive tasks such as problem-solving, decision-making, and learning. It plays a pivotal role in academic success, as it directly influences students' ability to process complex information, follow instructions, and complete tasks efficiently. Research has consistently demonstrated that working memory is not only crucial for academic achievement but also significantly impacts children's overall cognitive development (Roghani et al., 2022; Yao et al., 2024). Deficits in working memory are often linked to challenges in learning and attention, making it a key focus for educational interventions aimed at enhancing cognitive capacities (Asadi Rajani, 2023; Baniasadi, 2024).

Frustration tolerance, on the other hand, refers to an individual's ability to endure and manage situations involving obstacles, setbacks, or unmet expectations without becoming overly emotional or giving up. This emotional competency is essential for navigating both academic and social challenges, as it influences students' resilience, problem-solving abilities, and interpersonal interactions. Low frustration tolerance can lead to impulsive behaviors, academic underachievement, and difficulty adapting to new or stressful situations. Interventions that enhance frustration tolerance help children develop emotional regulation skills, enabling them to handle challenges constructively (Khodabandehlu et al., 2022; Potard et al., 2021).

Philosophy for Children (P4C) is an educational approach that has garnered significant attention for its role in fostering critical thinking, moral reasoning, and social-emotional development in children. Rooted in the pedagogical principles of inquiry-based learning, P4C emphasizes collaborative dialogue, reflective thinking, and the exploration of philosophical concepts through age-appropriate narratives and structured discussions (Cassidy, 2017, 2021; Cassidy et al., 2018). This approach, originally developed by Matthew Lipman, aims to empower children as active participants in their learning journey, encouraging them to question, analyze, and engage with the world around them (Michaud, 2020; Michaud & gregory, 2022). In recent years, P4C has been integrated into educational systems worldwide, including its adaptation in Iran, where cultural and religious contexts have further shaped its implementation (Abedi et al., 2019).

One of the central tenets of P4C is its focus on enhancing cognitive and emotional capacities in children. Research demonstrates that this method significantly improves students' critical thinking skills, self-regulation, and problem-solving abilities (Cassidy et al., 2018; Zulkifli & Hashim, 2020). The pedagogical approach of P4C also aligns with the principles of moral education, as it fosters empathy, tolerance, and a sense of responsibility among young learners (Cassidy, 2021). For instance, Abdollahpour et al. (2019) explored the alignment of P4C with Quranic teachings, emphasizing its potential to cultivate moral attitudes and ethical reasoning in students (Abdollahpour et al., 2019). Similarly, Zare et al. (2022) highlighted its effectiveness in promoting self-determination and responsibility among elementary school students, further reinforcing its relevance in diverse educational settings (Zare et al., 2022).

The cognitive benefits of P4C extend beyond critical thinking to include enhancements in working memory, sustained attention, and emotional regulation. Azizi et al. (2020) found that cognitive-behavioral play therapy, a related educational intervention, positively impacts working memory and attention in children with learning difficulties. These findings underscore the potential of structured educational programs like P4C to address cognitive challenges and improve overall academic performance (Azizi et al., 2020). Baniasadi (2024) further demonstrated a strong correlation between physical activity and working memory, suggesting that holistic approaches incorporating both cognitive and physical dimensions can yield significant developmental outcomes. In the context of P4C, the emphasis on intellectual engagement and active participation provides a robust framework for fostering these cognitive capacities (Baniasadi, 2024).

Emotional and social dimensions also play a crucial role in the P4C framework. The program has been shown to improve students' tolerance of ambiguity and resilience, particularly in challenging social and academic contexts (Golavari & Khayatan, 2022; Valizadeh & Ahmadi, 2023). These outcomes are particularly relevant for children who experience social or emotional difficulties, as P4C offers a supportive environment for exploring emotions, developing coping strategies, and building interpersonal skills (Cassidy et al., 2018). Hoxhaj and Baraku (2015) emphasized the inclusive nature of P4C, advocating for its integration in educational systems to promote equity and support for children with diverse needs (Hoxhaj & Baraku, 2015).

The adaptability of P4C to various cultural and educational contexts further highlights its global applicability. Ndofirepi (2012) argued that introducing P4C in African educational systems could enhance open-mindedness and quality education (Ndofirepi, 2012), while Michaud (2020) questioned the type of citizen that P4C aims to cultivate, advocating for a balance between individual autonomy and collective responsibility (Michaud, 2020). In Iran, the integration of P4C with Islamic teachings has provided a unique lens through which to explore its philosophical and moral dimensions (Abedi et al., 2019; Hosseiniamin et al., 2018). This cultural adaptation underscores the versatility of P4C in addressing diverse educational goals while remaining sensitive to local values and traditions.

In addition to its cognitive and emotional benefits, P4C has been associated with improved questioning skills and academic achievement. Hooshmandi et al. (2020) demonstrated that P4C significantly enhances students' ability to formulate meaningful questions, a critical skill for scientific inquiry and lifelong learning (Hooshmandi et al., 2020). These findings are consistent with the work of Shah Mohammadi (2020), who reported that teaching philosophy to children fosters critical thinking and academic success in sixth-grade students (Shah Mohammadi, 2020). Moreover, Lam (2021) highlighted the impact of P4C on teachers' professional development, emphasizing its transformative potential for educators and students alike (Lam, 2021).

Despite its proven benefits, the implementation of P4C presents challenges that must be addressed to maximize its effectiveness. For instance, Safriyani and Mustofa (2021) noted the importance of teacher training in ensuring the successful adoption of P4C in classrooms (Safriyani & Mustofa, 2021). Similarly, Kizel (2019) stressed the need for a supportive educational environment that encourages collaborative learning and active participation. These insights underscore the importance of a well-designed curriculum and adequate resources in facilitating the integration of P4C into existing educational frameworks (Kizel, 2019).

The present study seeks to build on this growing body of research by examining the impact of the P4C program on working memory and frustration tolerance in sixth-grade students. These variables were selected due to their critical role in cognitive and emotional development, as well as their influence on academic and social outcomes. Working memory, a key component of executive function, is essential for processing and retaining information, while frustration

tolerance reflects a child's ability to cope with challenges and setbacks (Asli Azad et al., 2020; Pourjaberi et al., 2023). By focusing on these constructs, this study aims to provide valuable insights into the mechanisms through which P4C facilitates cognitive and emotional growth.

Previous studies have highlighted the potential of P4C to address these developmental areas, but few have systematically examined their combined effects in a single intervention. For example, Berenjkar et al. (2018) explored the long-term sustainability of learning strategies acquired through P4C (Berenjkar et al., 2018), while Mirzaei et al. (2024) conducted a meta-analysis on its impact on cognitive skills (Mirzaei et al., 2024). However, there is a need for further research to elucidate the specific pathways through which P4C influences working memory and frustration tolerance, particularly in the context of elementary education.

In conclusion, the Philosophy for Children program offers a promising framework for addressing the cognitive, emotional, and social needs of students in diverse educational settings. By exploring its impact on working memory and frustration tolerance, this study seeks to expand the evidence base for P4C and highlight its potential as a transformative educational tool. The findings are expected to have implications for educators, policymakers, and researchers seeking to enhance the quality and inclusivity of education through innovative pedagogical approaches.

2. Methods and Materials

2.1. Study Design and Participants

The study utilized a semi-experimental design based on a purposeful (non-random) sampling approach, implementing a quasi-experimental framework with two groups (experimental group undergoing philosophy education for children and a control group) and three stages (pre-test, post-test, and one-month follow-up). The target population consisted of all sixth-grade male elementary school students in Yasuj during the 1403-1402 academic year.

The sampling method was a single-stage random cluster approach, where two schools were randomly selected from the elementary schools in Yasuj. Subsequently, two sixth-grade classes from each school were chosen, and 100 students completed questionnaires assessing working memory, academic self-handicapping, frustration tolerance, and social competence. Based on their scores, 50 students with low scores on working memory, frustration tolerance, and social competence questionnaires, along with high

scores on the academic self-handicapping questionnaire, were selected. These students were randomly assigned to the experimental group (25 students) or the control group (25 students).

The intervention group participated in 12 sessions of 50-minute philosophical education based on the "Philosophy for Children" program, conducted twice weekly. Meanwhile, the control group did not receive any intervention over the 45-day period. After completing the intervention, both groups underwent post-testing, followed by a one-month follow-up evaluation. Entry criteria included a lack of severe personality disorders or clinical diagnoses (assessed through DSM-based interviews), no use of psychotropic medications, specific scores on the questionnaires, a willingness to participate voluntarily, and absence from concurrent counseling or therapeutic sessions. Students missing more than two sessions or opting out were excluded.

2.2. Measures

2.2.1. Working Memory

The Daneman and Carpenter Working Memory Test (1980) was used to evaluate the working memory capacity of participants. This test includes 27 sentences divided into six sections, ranging from two-sentence sets to seven-sentence sets. Participants listened to these sentences, which were deliberately designed to be semantically challenging and unrelated to each other. They were then required to perform two tasks: first, determine whether each sentence was semantically accurate, and second, recall and write down the last word of each sentence. This dual task evaluates the processing and storage components of working memory. Scoring involved calculating the proportion of correct responses in each section, summing these scores, and dividing by two to produce a composite score that represents the participant's working memory capacity. Variants of the test allow participants to silently read the sentences or read them aloud before completing the recall task. Research has shown strong reliability for this tool, with correlation coefficients of 0.59 for verbal aptitude tests and 0.72 for comprehension tasks. In this study, the tool was administered under standard conditions, ensuring its applicability and comparability to other research contexts. The tool's reliability was previously validated in an Iranian sample, with a Cronbach's alpha of 0.88, confirming its appropriateness for assessing the working memory capacity of elementary students (Asadi Rajani, 2023).

2.2.2. Frustration Tolerance

The Harrington Frustration Tolerance Questionnaire (2005) was utilized to measure the participants' ability to tolerate frustration in challenging situations. This 35-item questionnaire assesses frustration tolerance across four dimensions: emotional distress intolerance, discomfort intolerance, progress intolerance, and unfairness intolerance. Items are rated on a 5-point Likert scale ranging from "strongly agree" (5) to "strongly disagree" (1). Higher scores indicate lower frustration tolerance, while lower scores signify greater resilience in handling frustration. The total score ranges from 35 to 175, with scores below 80 reflecting strong frustration tolerance, scores between 80 and 105 indicating moderate tolerance, and scores above 105 suggesting poor tolerance. Previous studies have confirmed the tool's validity and reliability in the Iranian context, with a Cronbach's alpha of 0.84 for the overall scale (Khodabandehlu et al., 2022).

2.3. Intervention

2.3.1. Philosophy for Children

The educational materials included "Stories for Thinking for Iranian Children" by Norouzi et al. (2015), as well as Philip Cam's "Thinking Stories 1 and 2" and Fisher's "Stories for Thinking" (2003). The sessions emphasized structured philosophical dialogue aimed at enhancing cognitive and emotional capacities (Abdollahpour et al., 2019; Ahmadvand et al., 2015; Ahmadvand et al., 2016; Pala, 2022; Safriyani & Mustofa, 2021; Zulkifli & Hashim, 2020).

The intervention protocol consisted of 12 structured sessions, each lasting 50 minutes, conducted twice weekly. The sessions followed the "Philosophy for Children" (P4C) framework, emphasizing critical thinking, reasoning, and dialogue through interactive storytelling and guided discussions.

Session 1: The introductory session established the goals and rules of the program. Participants were introduced to the concept of philosophical inquiry through a simple, engaging story that encouraged open-ended questions. The session focused on building a safe and inclusive environment for discussion.

Session 2: Participants explored the concept of "identity" through a story that raised questions about self-perception and individuality. Discussions centered on how individuals define themselves and relate to others, fostering self-awareness and empathy.

Session 3: This session introduced the theme of "decision-making" with a narrative that depicted characters facing moral dilemmas. Students were encouraged to analyze the characters' choices and articulate their reasoning, enhancing problem-solving and moral reasoning skills.

Session 4: The focus shifted to "critical thinking" by discussing a story that challenged conventional assumptions. Students identified biases, questioned beliefs, and considered alternative perspectives, promoting analytical thinking.

Session 5: A narrative on "teamwork and collaboration" was used to highlight the importance of working together and respecting diverse opinions. Participants engaged in group activities that required collective decision-making and communication.

Session 6: Midway through the program, the theme of "perseverance and frustration tolerance" was addressed. Through a story about overcoming obstacles, students reflected on their own experiences with challenges and developed strategies for resilience.

Session 7: The concept of "emotional regulation" was introduced using a story that depicted characters managing anger and disappointment. Guided discussions helped students identify their emotions and practice constructive responses.

Session 8: This session explored "justice and fairness," using a narrative that presented ethical dilemmas involving equality and fairness. Students debated the story's outcomes, learning to articulate and defend their views respectfully.

Session 9: A story focusing on "creativity and problem-solving" encouraged participants to think outside the box. They brainstormed innovative solutions to challenges faced by the story's characters, fostering divergent thinking.

Session 10: Participants revisited the theme of "empathy and understanding others" through a narrative emphasizing the value of compassion. Activities included role-playing to deepen their ability to see situations from others' perspectives.

Session 11: In this session, students engaged with a story about "responsibility and accountability." Discussions encouraged them to consider the consequences of actions and the importance of taking ownership of their behavior.

Session 12: The final session focused on integrating the skills learned throughout the program. Students participated in a reflective activity where they shared their insights and personal growth, followed by a group discussion to consolidate learning and celebrate their journey.

2.4. Data Analysis

Data analysis was performed using SPSS 26, incorporating descriptive statistics (means, standard deviations, and standard errors) and inferential methods. After ensuring assumptions such as normal distribution, homogeneity of error variances, and independence, analyses included covariance analysis (ANCOVA and MANCOVA) and Bonferroni post hoc tests. These analyses examined participant scores across the pre-test, post-test, and follow-up stages, enabling the evaluation of intervention efficacy.

3. Findings and Results

The demographic analysis of participants revealed that, in the control group, 7 fathers had a diploma or lower education level, 11 had a bachelor's degree, and 7 had a master's degree or higher. Among mothers, 12 had a diploma or lower education, 7 had a bachelor's degree, and 6 had a master's degree or higher. Similarly, in the experimental group, 6 fathers had a diploma or lower, 13 had a bachelor's degree, and 6 had a master's degree or higher. For mothers in the experimental group, 14 had a diploma or lower education, 8 had a bachelor's degree, and 3 had a master's degree or higher. Regarding occupation, 23 fathers in the control group were government employees, and 2 were self-employed, compared to 17 government employees and 8 self-employed fathers in the experimental group. Among mothers, 7 in the control group were employed, while 18 were homemakers, compared to 9 employed mothers and 16 homemakers in the experimental group.

Table 1

Descriptive Statistics for Working Memory and Frustration Tolerance Scores Across Groups and Stages

Group	Variable	Pre-Test M (SD)	Post-Test M (SD)	Follow-Up M (SD)
Control	Working Memory	10.92 (2.344)	10.89 (1.586)	10.75 (1.906)
Experimental	Working Memory	10.79 (2.320)	16.16 (2.684)	15.96 (2.129)
Control	Frustration Tolerance	116.35 (7.356)	115.04 (7.701)	115.49 (8.287)
Experimental	Frustration Tolerance	113.38 (8.364)	83.47 (7.839)	85.00 (7.915)

The descriptive statistics in Table 1 indicate that, in the control group, working memory scores remained relatively stable across the three stages, with minor decreases from pre-test (M = 10.92, SD = 2.344) to post-test (M = 10.89, SD = 1.586) and follow-up (M = 10.75, SD = 1.906). In contrast, the experimental group showed a substantial increase in working memory scores from pre-test (M = 10.79, SD = 2.320) to post-test (M = 16.16, SD = 2.684), which slightly declined but remained high at follow-up (M = 15.96, SD = 2.129). For frustration tolerance, the control group displayed consistent scores across stages, with a slight reduction from pre-test (M = 116.35, SD = 7.356) to post-test (M = 115.04, SD = 7.701) and follow-up (M = 115.49, SD = 8.287). The experimental group exhibited a significant reduction in frustration tolerance scores from pre-test (M = 113.38, SD = 8.364) to post-test (M = 83.47, SD = 7.839), with scores remaining stable at follow-up (M = 85.00, SD = 7.915). These findings suggest that the intervention effectively enhanced working memory and reduced frustration tolerance levels in the experimental group.

All statistical assumptions, including normal distribution of variables, equality of error variances, and independence of observations, were checked and met. The sample included 50 participants evenly divided between the control and experimental groups. However, the assumption of sphericity was violated, necessitating adjustments using the Greenhouse-Geisser correction for repeated measures.

Table 2

Results of Repeated-Measures ANOVA for Working Memory and Frustration Tolerance

Source	Sum of Squares	df	Mean Squares	F	p	Eta Squared
Repetition (Working Memory)	223.463	1.939	115.218	90.246	0.001	0.653
Group x Repetition	240.688	1.939	124.099	97.203	0.001	0.669
Error	118.855	93.095	1.277			
Repetition (Frustration Tolerance)	7641.809	1.457	5244.530	295.701	0.001	0.860
Group x Repetition	6566.860	1.457	4506.799	254.106	0.001	0.841
Error	1240.464	69.941	17.736			

The analysis in Table 2 revealed significant differences in working memory and frustration tolerance scores across groups and stages. For working memory, there was a significant main effect of time ($F(1.939, 93.095) = 90.246$, $p < 0.001$, $\eta^2 = 0.653$) and a significant interaction between time and group ($F(1.939, 93.095) = 97.203$, $p < 0.001$, $\eta^2 = 0.669$). Similarly, frustration tolerance showed significant effects of time ($F(1.457, 69.941) = 295.701$, $p < 0.001$, $\eta^2 = 0.860$) and a significant time-group interaction ($F(1.457, 69.941) = 254.106$, $p < 0.001$, $\eta^2 = 0.841$).

Table 3

Bonferroni Post-Hoc Comparisons for Experimental Group

Variable	Stage Comparison	Mean Difference	Std. Error	p
Working Memory	Pre-Test vs Post-Test	-5.372	0.322	0.001
	Pre-Test vs Follow-Up	-5.172	0.334	0.001
Frustration Tolerance	Pre-Test vs Post-Test	29.909	1.099	0.001
	Pre-Test vs Follow-Up	28.381	1.213	0.001

Post-hoc comparisons using Bonferroni adjustments in Table 3 showed significant improvements in working memory scores from pre-test to post-test ($p < 0.001$) and pre-test to follow-up ($p < 0.001$) in the experimental group. Similarly, frustration tolerance scores improved significantly from pre-test to post-test ($p < 0.001$) and pre-test to follow-up ($p < 0.001$). There were no significant differences between post-test and follow-up stages for both variables, indicating sustained effects of the intervention.

4.   Discussion and Conclusion

The present study examined the impact of the Philosophy for Children (P4C) program on working memory and frustration tolerance in sixth-grade students. The findings revealed significant improvements in both variables for the experimental group compared to the control group, indicating the efficacy of the P4C program in enhancing cognitive and emotional capacities. The experimental group

showed substantial gains in working memory scores from pre-test to post-test, which were sustained at follow-up. Similarly, frustration tolerance scores demonstrated a marked reduction in the experimental group, signifying an enhanced ability to manage frustration and cope with challenges.

The improvement in working memory aligns with previous studies that emphasize the role of structured educational interventions in boosting cognitive functions. For instance, Azizi et al. (2020) highlighted the positive effects of cognitive-behavioral play therapy on working memory and sustained attention, which parallels the intellectual engagement facilitated by the P4C framework (Azizi et al., 2020). Moreover, Berenjkar et al. (2018) found that P4C significantly improved students' learning strategies, which are closely linked to working memory and executive function (Berenjkar et al., 2018). The interactive nature of the P4C program, involving active participation and reflective thinking, likely contributed to these gains by engaging students in complex cognitive tasks.

The observed enhancement in frustration tolerance supports findings from prior research emphasizing the emotional and social benefits of P4C. For example, Cassidy et al. (2018) reported that P4C fosters self-regulation and engaged participation, critical factors in managing frustration and emotional challenges (Cassidy et al., 2018). Similarly, Golavari and Khayatan (2022) demonstrated that educational interventions could significantly increase tolerance of ambiguity and resilience, attributes that align with improved frustration tolerance (Golavari & Khayatan, 2022). The dialogic and collaborative approach of P4C likely provided students with a supportive environment to explore and regulate their emotions, contributing to the observed outcomes.

One of the key mechanisms underlying the effectiveness of P4C is its emphasis on critical thinking and moral reasoning, which foster self-awareness and emotional control. Zare et al. (2022) reported that P4C enhances self-determination and responsibility, skills that are essential for managing frustration (Zare et al., 2022). Furthermore, the alignment of P4C with cultural and moral values, as highlighted by Abdollahpour et al. (2019), may have reinforced students' ability to navigate challenges in a manner consistent with their personal and social identities (Abdollahpour et al., 2019). These findings suggest that P4C not only addresses cognitive and emotional needs but also integrates seamlessly into culturally diverse educational contexts.

The sustained improvements observed at follow-up highlight the long-term benefits of P4C, a finding consistent with Berenjkar et al. (2018), who reported the durability of learning strategies acquired through P4C (Berenjkar et al., 2018). This sustainability may be attributed to the program's focus on internalizing critical thinking and problem-solving skills, which continue to influence students' behavior beyond the intervention period. Additionally, the repetitive and reflective nature of the P4C sessions likely reinforced these skills, ensuring their retention and application in real-life scenarios.

The findings of this study also contribute to the broader discourse on the role of educational interventions in promoting holistic development. The integration of cognitive and emotional dimensions within the P4C framework addresses the interconnected nature of these domains, as evidenced by the simultaneous improvement in working memory and frustration tolerance. As highlighted by Baniasadi (2024), cognitive and physical dimensions are interrelated, and interventions targeting one aspect often have cascading effects on others (Baniasadi, 2024). The P4C program exemplifies this holistic approach by combining intellectual engagement with emotional exploration, thereby fostering comprehensive development.

The improvements in frustration tolerance observed in this study also resonate with research emphasizing the social and emotional benefits of educational interventions. Golavari and Khayatan (2022) noted that schema therapy significantly enhanced resilience and emotional regulation, outcomes that align closely with the goals of P4C (Golavari & Khayatan, 2022). Furthermore, Hosseiniamin et al. (2018) demonstrated that philosophy education positively influences social behavior, underscoring the potential of P4C to enhance interpersonal skills and emotional well-being (Hosseiniamin et al., 2018). By providing a platform for collaborative dialogue and empathy-building, P4C addresses the underlying factors contributing to frustration and equips students with the tools to navigate emotional challenges effectively.

While the findings of this study are promising, several limitations must be acknowledged. First, the sample size was relatively small and limited to a specific geographical location, which may restrict the generalizability of the results to broader populations. Second, the study relied on self-reported measures for assessing frustration tolerance, which may introduce bias or inaccuracies in reporting. Third, the follow-up period was limited to one month, leaving the long-term sustainability of the observed improvements

unclear. Finally, external variables such as familial support, teacher involvement, or other concurrent interventions were not controlled, potentially influencing the outcomes.

Future research should address the limitations identified in this study by employing larger and more diverse samples to enhance the generalizability of the findings. Longitudinal studies with extended follow-up periods are recommended to examine the durability of the program's effects over time. Researchers could also explore the impact of P4C on additional cognitive and emotional variables, such as decision-making, problem-solving, and resilience, to provide a more comprehensive understanding of its benefits. Comparative studies investigating the effectiveness of P4C across different cultural and educational contexts would also offer valuable insights into its adaptability and scalability. Finally, integrating objective measures, such as neurocognitive assessments, could provide more robust evidence of the program's impact on cognitive functions.

Educational practitioners are encouraged to incorporate the P4C program into school curricula to enhance cognitive and emotional development in students. Providing comprehensive training for teachers on the principles and implementation of P4C is essential to ensure its effective delivery. Schools should create a supportive environment that fosters open dialogue, critical thinking, and collaborative learning, key components of the P4C framework. Policymakers should also consider integrating P4C into national educational standards to promote holistic development and prepare students for the challenges of the modern world. Additionally, adapting the program to align with local cultural and moral values can maximize its relevance and impact in diverse educational settings.

Authors' Contributions

All authors significantly contributed to this study.

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

Declaration of Interest

The authors report no conflict of interest.

Funding

Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants. Each participant received an informed consent form to understand the study's objectives.

References

Abdollahpour, R., Sarmadi, M. R., Biranvand, Z., & Seifi, M. (2019). The Effect of Philosophy for Children (P4C) Program on Students' Moral Attitude and Its Explanation According to the Quran. *Research in Islamic Education Issues*, *27*(43). https://www.sid.ir/paper/243392/fas

Abedi, M., Noroozi, R. A., Mehrabi, H. A., & Heidari, M. H. (2019). Identifying the Components of Philosophy for Children in the Teachings of Imam Ali (AS). *Islamic Education*, *7*(14), 115-137. https://islamicedu.rihu.ac.ir/article_1524.html

Ahmadvand, K., Ahmadi, H., & Hedayat, G. H. D. S. (2015). The philosophy of play and its role in the intellectual development of children based on the P4C program. *Philosophy and Children*, *3*(4), 49. https://www.noormags.ir/view/fa/articlepage/1267177/%D9%81%D9%84%D8%B3%D9%81%D9%87-%D8%A8%D8%A7%D8%B2%DB%8C-%D9%88-%D9%86%D9%82%D8%B4-%D8%A7%D9%86-%D8%AF%D8%B1-%D8%B1%D8%B4%D8%AF-%D8%B9%D9%82%D9%84%D8%A7%D9%86%DB%8C-%DA%A9%D9%88%D8%AF%DA%A9%D8%A7%D9%86-%D8%A8%D8%B1-%D8%A7%D8%B3%D8%A7%D8%B3-%D8%A8%D8%B1%D9%86%D8%A7%D9%85%D9%87-p4c

Ahmadvand, K., Ahmadi Hedayat, H., & Gholami Haredashti, S. (2016). The philosophy of play and its role in the intellectual development of children based on the P4C program. *Journal of Philosophy and Children*, *3*(4), 49. https://www.magiran.com/paper/1625163/philosophy-of-play-and-its-role-in-children-s-intellectual-growth-based-on-p4c?lang=en

Asadi Rajani, M. (2023). Investigating the Performance of Selective Attention and Working Memory in Adolescents Recovered from Acute Covid-19 with Normal Adolescents. *International Journal of Education and Cognitive Sciences*, *3*(4), 44-51. https://doi.org/10.22034/injoeas.2023.357896.1036

Asli Azad, M., Manshaee, G. R., & Ghamarani, A. (2020). Effectiveness of Acceptance and Commitment Therapy on Cognitive Emotion Regulation and Intolerance of uncertainty of The Students with Obsessive-Compulsive Disorder. *Psychology of Exceptional Individuals*, *9*(36), 33-53. https://doi.org/10.22054/jpe.2019.44480.2027

Azizi, A., Drikvand, F. M., & Sepahvandi, M. A. (2020). Effect of cognitive - behavioral play therapy on working memory, short-term memory and sustained attention among school-aged children with specific learning disorder: a preliminary randomized controlled clinical trial. *Current Psychology*, *39*(6), 2306-2313. https://doi.org/10.1007/s12144-018-9914-7

Baniasadi, T. (2024). Comparison of Executive Function and Working Memory among Children with High and Low Levels of Physical Activity. *International Journal of Education and Cognitive Sciences*, *5*(3), 9-15. https://doi.org/10.61838/kman.ijeas.5.3.2

Berenjkar, M., Aghqar, G., & Ansarian, F. (2018). The Effectiveness of Teaching Philosophy to Children on Students' Learning Strategies and Its Sustainability Over Time. *Thinking and Children*, *9*(1), 73-94. http://ensani.ir/fa/article/415074/%D8%A7%D8%AB%D8%B1-%D8%A8%D8%AE%D8%B4%DB%8C-%D8%A2%D9%85%D9%88%D8%B2%D8%B4-%D9%81%D9%84%D8%B3%D9%81%D9%87-%D8%A8%D9%87-%DA%A9%D9%88%D8%AF%DA%A9%D8%A7%D9%86-%D8%A8%D8%B1-%D8%B1%D8%A7%D9%87%D8%A8%D8%B1%D8%AF%D9%87%D8%A7%DB%8C-%DB%8C%D8%A7%D8%AF%DA%AF%DB%8C%D8%B1%DB%8C-%D8%AF%D8%A7%D9%86%D8%B4-%D8%A2%D9%85%D9%88%D8%B2%D8%A7%D9%86-%D9%88-%D9%BE%D8%A7%DB%8C%D8%AF%D8%A7%D8%B1%DB%8C-%D8%A2%D9%86-%D8%AF%D8%B1-%D8%B7%D9%88%D9%84-%D8%B2%D9%85%D8%A7%D9%86

Cassidy, C. (2017). Philosophy With Children: A Rights-Based Approach to Deliberative Participation. *The International Journal of Children S Rights*, *25*(2), 320-334. https://doi.org/10.1163/15718182-02502003

Cassidy, C. (2021). Philosophy With Children as and for Moral Education. 13-28. https://doi.org/10.1007/978-3-662-64180-4_2

Cassidy, C., Marwick, H., Deeney, L., & McLean, G. (2018). Philosophy with children, self-regulation and engaged participation for children with emotional-behavioural and social communication needs. *Emotional and Behavioural Difficulties*, *23*(1), 81-96. https://doi.org/10.1080/13632752.2017.1388654

Golavari, M., & Khayatan, F. (2022). The Effectiveness of Schema Therapy on The Ambiguity Tolerance and Resilience in Mothers of Children with Attention Deficit Hyperactivity Disorder. *Journal of Clinical Psychology and Personality*, *20*(1). https://cpap.shahed.ac.ir/article_3864.html

Hooshmandi, f., Shamshiri, B., & Abroshannt, h. (2020). The Effect of Pedagogical Approach of Philosophy for Children on the Questioning in Science Course (The Case: First Grade Elementary School Students). *Educational and Scholastic studies*, *9*(1), 171-192. https://pma.cfu.ac.ir/article_1211.html

Hosseiniamin, H., Kahnooji, M., & Iran Nejad Parizi, S. J. (2018). The Effects of Philosophy Education on the Social Behavior of the 5th and 6th-Grade Male Students in the Primary Schools of Sarcheshmeh City. *Community Health Journal*, *12*(1), 41-48. https://www.magiran.com/paper/1900719

Hoxhaj, E., & Baraku, I. (2015). The Integration in Educational System of Children With Disability - A Philosophy and a Legal Obligation. *European Journal of Social Sciences Education and Research*, *3*(1), 66. https://doi.org/10.26417/ejser.v3i1.p66-71

Khodabandehlu, N., Fathiagdam, G., Babakhani, V., & Alijani, F. (2022). "Emotion-Oriented Therapy" on Academic Procrastination and Frustration disComfort of Male High School Students. *jhpm.ir*, *11*(6), 93-105. https://doi.org/10.22034/JHPM.11.6.93

Kizel, A. (2019). Following Philosophy With Children Concepts in Practice of Teacher Education. *Childhood & Philosophy*, *15*, 01-21. https://doi.org/10.12957/childphilo.2019.44574

Lam, C. M. (2021). The impact of Philosophy for Children on teachers' professional development. *Teachers and Teaching*, *27*(7), 642-655. https://doi.org/10.1080/13540602.2021.1986693

Michaud, O. (2020). What kind of citizen is philosophy for children educating? What kind of citizen should it be educating? *Philosophical Inquiry in Education*, *27*(1), 31-45. https://www.erudit.org/en/journals/pie/2020-v27-n1-pie05374/1070276ar/abstract/

Michaud, O., & gregory, M. R. (2022). Philosophy for Children as a Form of Spiritual Education. *Childhood & Philosophy*, *18*, 01-24. https://doi.org/10.12957/childphilo.2022.69865

Mirzaei, L., Golizade, Z., & Samadi, Z. (2024). Meta-analysis of the effectiveness of teaching philosophy to children on students' cognitive skills. *Thinking and Children*. https://fabak.ihcs.ac.ir/article_9263_en.html?lang=fa

Ndofirepi, A. P. (2012). Quality Education in Africa: Introducing Philosophy for Children to Promote Open-Mindedness. *Africa Education Review*, *9*(sup1), S26-S40. https://doi.org/10.1080/18146627.2012.755242

Pala, F. (2022). The Effect of Philosophy Education for Children (P4C) on Students' Conceptual Achievement and Critical Thinking Skills: A Mixed Method Research. *Education Quarterly Reviews*, *5*(3). https://doi.org/10.31014/aior.1993.05.03.522

Potard, C., Pochon, R., Henry, A., Combes, C., Kubiszewski, V., & Roy, A. (2021). Relationships Between School Bullying and Frustration Intolerance Beliefs in Adolescence: A Gender-Specific Analysis. *Journal of Rational-Emotive & Cognitive-Behavior Therapy*. https://doi.org/10.1007/s10942-021-00402-6

Pourjaberi, B., Shirkavand, N., & Ashoori, J. (2023). The Effectiveness of Cognitive Rehabilitation Training on Prospective Memory and Cognitive Flexibility in Individuals with Depression. *International Journal of Education and Cognitive Sciences*, *4*(3), 45-53. https://doi.org/10.61838/kman.ijecs.4.3.5

Roghani, F., Jadidi, M., & Peymani, J. (2022). The Effectiveness of Floortime Play Therapy on Improving Executive Functions and Cognitive Emotion Regulation in Children with Attention Deficit / Hyperactivity Disorder (ADHD). *International Journal of Education and Cognitive Sciences*, *2*(4), 30-44. https://doi.org/10.22034/injoeas.2022.160686

Safriyani, R., & Mustofa, A. (2021). Promoting Philosophy for Children (P4C) in Teaching Reading. *English Teaching Journal a Journal of English Literature Language and Education*, *9*(2), 120. https://doi.org/10.25273/etj.v9i2.10948

Shah Mohammadi, N. (2020). Examining the Effectiveness of Teaching Philosophy to Children on Critical Thinking in Sixth Grade Students. *Thinking and Children*, *11*(1), 95-116. https://www.magiran.com/paper/2211224/%D8%A8%D8%B

1%D8%B1%D8%B3%DB%8C-
%D8%A7%D8%AB%D8%B1%D8%A8%D8%AE%D8%B
4%DB%8C-
%D8%A2%D9%85%D9%88%D8%B2%D8%B4-
%D9%81%D9%84%D8%B3%D9%81%D9%87-
%D8%A8%D9%87-
%DA%A9%D9%88%D8%AF%DA%A9%D8%A7%D9%8
6-%D8%A8%D8%B1-
%D8%AA%D9%81%DA%A9%D8%B1%D8%A7%D9%86
%D8%AA%D9%82%D8%A7%D8%AF%DB%8C-
%D8%AF%D8%A7%D9%86%D8%B4-
%D8%A2%D9%85%D9%88%D8%B2%D8%A7%D9%86-
%D9%BE%D8%A7%DB%8C%D9%87-
%D8%B4%D8%B4%D9%85

Valizadeh, H., & Ahmadi, V. (2023). The effectiveness of mindfulness-based cognitive therapy on happiness and tolerance of ambiguity in mothers of children with autism spectrum disorder. *Applied Psychology*, *1*(65), 193-212. https://apsy.sbu.ac.ir/article_102572.html?lang=en

Yao, C., Jun, H., & Dai, G.-S. (2024). Predicting Phonological Awareness: The Roles of Mind-Wandering and Executive Attention. *International Journal of Education and Cognitive Sciences*, *5*(2), 1-7. https://doi.org/10.22034/injoeas.2024.454689.1084

Zare, R., Taklavi, S., & Ghaffari, A. (2022). The Effectiveness of the Children Philosophy Education on Self-determination and Responsibility of the Elementary Students [Research]. *Rooyesh-e-Ravanshenasi Journal(RRJ)*, *10*(12), 37-48. http://frooyesh.ir/article-1-3265-en.html

Zulkifli, H., & Hashim, R. (2020). Philosophy for children (P4C) in improving critical thinking in a secondary moral education class. *International Journal of Learning, Teaching and Educational Research*, *19*(2), 29-45. http://ijlter.myres.net/index.php/ijlter/article/view/431