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# Enhancing participatory executive functions to improve the quality of life of preschool ethnic children in Thailand's border patrol police schools

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## **Abstract**

This research aimed to (1) develop interventions for enhancing executive functions (EFs) and (2) examine the effects of participatory EF enhancement in ethnic preschool children. The researchers sampled 197 preschool teachers and parents from 7 Border Patrol Police Schools in northern Thailand using simple random sampling. The research instruments included questionnaires, interviews, a curriculum, a lesson plan, and assessment forms. All interventions were validated by experts, with content validity indices ranging from 0.80 to 1.00, indicating high quality and reliability. Data were analyzed using descriptive statistics (mean and standard deviation) and standard scores (T-score). The research findings revealed that: 1) the curriculum for enhancing preschool EF teaching skills was valid and of high quality; 2) the evaluation results of teachers lesson plans and teaching skills were at a very good level; and 3) parental participation in the EF enhancement process is important. Comparing the EFs of preschool children before and after learning, a t-value of 46.62 was obtained, indicating a statistically significant difference at the 0.05 level, showing that the average EF score after learning was higher than before learning. The research revealed that interventions significantly improve preschool children's systematic thinking skills and may improve social performance in the long term.

Keywords: Border patrol police schools, Critical thinking skills, Enhancing teacher competencies, Executive functions, Northern Thailand, Parental participation, Preschool ethnic children, Quality of life in children.

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## **Contents**

1. Introduction	125
2. Research Objectives	
3. Research Significance	
4. Literature Review	
5. Method	
6. Results	
7. Discussion	
8. Conclusion	
9. Suggestion	199

## Contribution of this paper to the literature

This study contributes to promoting participatory executive functions (EFs) development for preschool ethnic children by providing them with opportunities to access and learn about EFs, while enabling them to understand themselves and others, and to develop critical thinking skills. Furthermore, it offers teachers effective approaches to fostering EFs, which will tangibly impact the quality of life of preschool ethnic children and help reduce inequalities in education for ethnic groups.

## 1. Introduction

The quality of youth, as a result of proper upbringing and education, is very important for national development. Developing the potential of students at all levels is crucial, especially for preschool children, who are considered valuable resources for their families and for their country's future (Ministry of Education, 2017). They are the hope of the family and a significant force in driving the development of a nation. Preschool age (3-6 years old) is the most critical period of life, during which the brain grows at its highest rate. Fostering good brain development at this age is a vital foundation for development in other stages of life. Enhancing executive functions (EFs) involves training the frontal EFs related to thinking processes and self-regulation in preschool children, providing a good foundation for them to grow into responsible youth and citizens who are intelligent, capable of thinking and doing, and happy. This development will also help to reduce ongoing problems such as drug abuse and violence, since EFs contribute to self-regulation.

In the current conditions, Thai children are being pushed to study with a focus on developing IQ as the main focus. Learning through practice is limited. This results in children lacking analytical thinking skills and being unable to solve problems when faced with them (RLG Group, 2016). The situation is especially true for students in remote schools, such as those attending the Border Patrol Police schools in Thailand's upper northern region, where most schools are located in mountainous areas with inconvenient transportation and difficult travel. The majority of students are ethnic minority children with problems in using the Thai language and need teachers' guidance. Unfortunately, many teachers are not trained to teach, hence students' learning achievement becomes challenging (Sanit, 2018). This may result in educational inequality among children, especially those at the preschool level. Preschool education is crucial because it establishes a quality learning experience for children and a foundation for their overall development. Enhancing knowledge and understanding of teachers and parents on EFs is important, as a principle for advancing frontal lobe skills that enable children to control and manage their thoughts, emotions, and behaviors effectively. Laying a strong foundation for EF skills is extremely important (Jongjit & Santi, 2024; Thai Health Promotion Foundation and RLG Institute (Rakluke Learning Group), 2018) because EFs will support learning and problem-solving throughout life. For the development of children's quality of life, teachers play a key role in promoting children's growth and skills through close supervision in learning management. If teachers place importance on learning and possess a strong awareness and understanding of Executive Functions (EFs), they can effectively foster EFs in children. This will prepare them to become strong, self-reliant, and high-quality newgeneration citizens effectively (Thai Health Promotion Foundation and RLG Institute (Rakluke Learning Group),

Recognizing the importance of prioritizing EFs, the researcher conducted the research project on "Participatory Executive Functions Enhancement to Improve the Quality of Life of Ethnic Preschool Children in Border Patrol Police Schools." The purpose of the project was to encourage all parties involved in preschool education and children to realize the importance of enhancing children's brain skills along with physical, emotional, mental, social, and intellectual development, in order to build a foundation and driving force for a sustainable quality society.

## 2. Research Objectives

- 1. To develop interventions for enhancing collaborative EFs to improve the quality of life for preschool ethnic minority children in Thailand's Border Patrol Police Schools.
- 2. To examine the effects of collaborative and participatory EF enhancement in preschool ethnic minority children attending the Border Patrol Police Schools.

## 3. Research Significance

The results of this research will provide preschool students in Thailand's Border Patrol Police Schools with the opportunity to access and learn EFs, enabling them to build self-awareness, recognize and understand others' perspectives, learn to think critically, and behave with integrity. These EF skills and abilities will support robust development in the quality of life for preschool ethnic minority children and help reduce educational inequality for ethnic groups. This research will also yield knowledge about the process of enhancing EFs and integrated participatory operations, guiding teachers to develop collaborative programs to enhance brain skills in preschool children. The research models and results can be adapted and replicated in other schools.

# 4. Literature Review

## 4.1. The Importance of EFs

EFs are advanced frontal lobe skills that control thoughts, decision-making, emotions, and actions. EFs begin to develop after birth, especially between 3 and 5 years of age, which is considered a window of opportunity for the continuous growth and development of EFs into adolescence and early adulthood (Center on the Developing Child at Harvard University, 2018; Nuanchan, 2018). EFs help individuals achieve self-control, which is essential for children to successfully navigate social situations in everyday life. EFs are essential basic skills for building children's social interactions through activities that engage children in learning and playing. When interactions and surrounding environments cannot support the development of EF skills in early childhood stages, education management should focus on developing and integrating EFs into learning activities to help them navigate life successfully (Yildirim & Düzyol, 2023).

Research suggests that strong EF skills can affect various dimensions of life, including physical, emotional, social, and spiritual (Supawadee, 2016; Thai Health Promotion Foundation, 2017). Physically, poor EFs can lead to decreased physical activity and increased risk for certain health issues such as obesity or substance addiction.

Emotionally and mentally, weak EFs can lead to social problems, crime, aggressive and violent behavior. Spiritually, particularly in childhood, EFs are more important for readiness to learn than IQ. Practicing EFs from early childhood will develop cognitive flexibility, enabling children to adapt their thinking and behavior in response to changes in their environments and manage their thoughts and actions. Developing EFs for early childhood children will help build behavior for a preferred and improved future.

## 4.2. Components of EFs

A review of the literature related to EFs shows that EFs are divided into three groups of skills, consisting of nine different aspects (Panadda, 2018; Thai Health Promotion Foundation, 2017): 1) Basic skills, including working memory, inhibitory control, and cognitive flexibility; 2) self-regulation skills, including sustained attention, emotional control, and self-monitoring; and 3) practical skills, including initiation and action, planning and organizing, and goal-directed persistence. These skills help enhance the quality of brain function development and enable human beings to live a happy life in a peaceful society.

## 4.3. Models for Enhancing EFs

Enhancing EFs for early childhood children is an important process in developing children's thinking, planning, and behavioral control. This skill can be enhanced through various activities that stimulate children to think, analyze, and solve problems (Kwanfah, Panrak, Seelsupa, & Siripong, 2019; Thai Health Promotion Foundation, 2017). A practical model for enhancing EFs in early childhood involves participation in learning management and effective learning. Firstly, collaboration between home and school should be explored and strengthened. Due to children's different family backgrounds, it is essential that teachers involve parents in aspects that deal with the learning and mental and physical growth of their children. Parental involvement in children's learning improves learning outcomes, including social skills and abilities to interact effectively and harmoniously with others. Secondly, a joyful learning environment should be created, providing a safe space where children feel comfortable expressing their thoughts and feelings. The process of child development must allow children to learn at their own pace and follow their interests. From this basis, EF enhancement in early childhood should focus on creating inner happiness, guided and supported by external factors, which will help cultivate a genuine love of learning in children. Based on these theoretical foundations, the conceptual research framework was developed as shown in Figure 1.

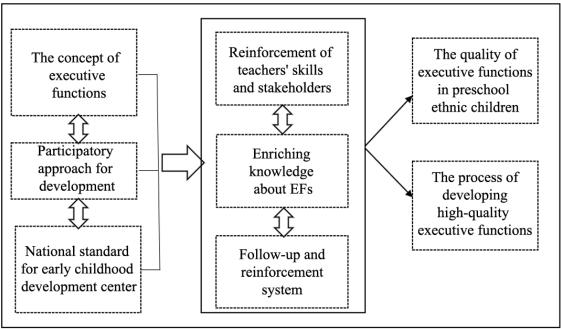


Figure 1. Conceptual Framework of Enhancing Participatory Executive Functions to Improve the Quality of Life of Preschool Ethnic Children in Thailand's Border Patrol Police Schools.

## 5. Method

## 5.1. Population and Sample Groups

The research population consisted of 319 preschool teachers and parents in 14 Border Patrol Police schools administered by the Border Patrol Police Command 33 in Chiang Mai Province.

The sample groups for this research consisted of 197 preschool teachers and parents in 7 Border Patrol Police schools administered by the Border Patrol Police Command 33 in Chiang Mai Province: 1) Chiang Thai Thamrong, 2) Tutiyapho Anusorn, 3) Aoyama, 4) Ban Nong Khaem, 5) Chalerm Phrakiat Ban Kae Noi, 6) Chao Por Luang Uppatham 2, and 7) Lions Mahachakra 9. The researcher used a simple random sampling technique at a 95% confidence level. All participating schools were fully aware of the research purposes and expressed their willingness to engage in the research activities.

## 5.2. Research Tools

The tools used in this research included: 1) a questionnaire for assessing teachers' needs in promoting preschool executive functions (EFs); 2) an interview guide for parents concerning problems observed in preschool children; 3) a preschool EF teaching skill development curriculum for teachers; 4) an evaluation form for teachers' lesson plans; 5) an evaluation form for teachers' learning management to develop EFs; 6) an evaluation form for preschool EFs; and 7) a focus group discussion record form for lessons learned in preschool EFs between teachers and parents. All these tools were submitted to experts for content validity verification using the Index of Congruency (IOC) criterion of 0.50 or higher. It was found that all tools had an IOC between 0.80-1.00, which is considered high quality.

#### 5.3. Research Data Collection

The researcher evaluated EFs before and after instruction using a one-group pretest-posttest design as follows:

$$O_1$$
 X  $O_2$ 

O1 is the pre-instruction test.

X is the activity to enhance EFs in preschool children.

O2 is the post-instruction test.

Research procedures were as follows: 1) Conducting a survey to identify needs and exchanging knowledge with teachers and relevant stakeholders, particularly the parents; 2) Using the analysis results from the field visit and discussions with parents to develop a curriculum for enhancing teachers' potential in promoting EFs in preschool ethnic children in the Border Patrol Police schools; 3) Using the designed curriculum to train teachers to develop skills in promoting preschool EFs; 4) Implementing the development of preschool EFs by teachers throughout the academic year; 5) Monitoring the results of preschool EFs development by teachers and organizing forums to build understanding among parents of preschool children in promoting EFs; 6) Developing a summary of the results of preschool EFs development in collaboration between teachers and parents; and 7) Summarizing and synthesizing the research results and findings.

## 5.4. Data Analysis and Statistics

Questionnaires and evaluation forms were analyzed using mean and standard deviation. Preschool EFs evaluation forms were analyzed using standard scores (T-score). The mean scores of preschool EFs before and after learning were compared using a t-test. Interview and focus group discussion data were analyzed using frequency and descriptive analysis.

## 6. Results

Based on the results of participatory analyses of the conditions and teachers' needs for enhancing the EFs of preschool ethnic children in the border patrol police schools, the researcher developed and applied the curriculum for enhancing the potential of teachers in promoting EFs of preschool ethnic children. It was found that the Index of Consistency (IOC) was between 0.80-1.00 (Table 1), indicating all aspects of the curriculum evaluation as high quality (the validity value was higher than the specified criterion of 0.50), making it suitable for further teacher development.

**Table 1.** Results of the validity analysis of the curriculum for enhancing teacher competency in promoting EFs among ethnic preschool children in border patrol police schools.

Evaluation item	IOC score	Interpretation
1. Background aligns with the curriculum.	1.00	Acceptable
2. Learning objectives are comprehensive and consistent with content.	1.00	Acceptable
3. Content is developmentally appropriate for learners.	1.00	Acceptable
4. Learning activities cover learning units and objectives.	1.00	Acceptable
5. Learning activities are diverse and correspond to preschool brain development.	1.00	Acceptable
6. Integration of innovations in learning activities	1.00	Acceptable
7. Innovation implementation plans are appropriate for solving problems.	0.80	Acceptable
8. Learning media/resources are appropriate and consistent with learning activities.	0.80	Acceptable
9. Assessment methods are clearly aligned with objectives.	1.00	Acceptable
10. Assessment methods are diverse, emphasizing authentic assessment.	1.00	Acceptable

After teachers applied the knowledge to design learning experiences for enhancing EFs among ethnic preschool children in the Border Patrol Police Schools, the analysis shows that most students achieved skill levels classified as "Good" (T-score 56–60), accounting for 58.95% (Table 2). Notably, no students were in the categories requiring improvement or development.

 Table 2. Assessment results of EFs among ethnic preschool children before and after instruction by teachers in border patrol police schools

Score	Skill level	Before		After	
		Number	%	Number	%
T-score < 40	Needs improvement	23	24.21	-	-
T-score 40–44	Should develop	5	5.26	-	-
T-score 45–55	Moderate	34	35.79	16	16.84
T-score 56–60	Good	24	25.26	56	58.95
T-score ≥ 60	Excellent	9	9.47	24	24.21

The comparison of mean scores before and after EF-integrated instruction yielded a t-value of 46.62 (Table 3), indicating a statistically significant difference at the 0.05 level. This shows that the post-instruction average score was significantly higher than the pre-instruction score.

 Table 3. Comparison of mean EFs Scores Before and After EF-Integrated Instruction for Ethnic Preschool Children

Instruction phase	N	Mean	SD	t-value	
Before	95	86.74	28.23	46.62*	
After	95	128.08	4.28		

Note: \* Statistically significant at the 0.05 level.

#### 7. Discussion

The development of a participatory process to enhance EFs for improving the quality of life among ethnic preschool children in Thailand's Border Patrol Police Schools resulted in a high-quality curriculum for enhancing teachers' competency in promoting EFs. The curriculum was developed based on the researcher's understanding of the importance of cognitive development during the preschool age as a critical period for learning readiness. This

aligns with the concept developed by the Center on the Developing Child at Harvard University (2018), which states that EFs begin to develop after birth, especially between 3-5 years of age, which is considered a window of opportunity for the growth and development of EFs, and they continue to develop into adolescence and early adulthood. EFs are very important for children. Therefore, activity management should focus on developing EFs as a learning tool integrated into activities from early childhood.

The curriculum for enhancing EFs for preschool ethnic children was implemented and integrated into the research in accordance with the framework of the National Institute for Child and Family Development at Mahidol University and the Thai Health Promotion Foundation (Panadda, 2018; Thai Health Promotion Foundation, 2017). The curriculum aimed to comprehensively foster the development of higher-order brain functions in preschoolers. Findings indicated that the participatory EF enhancement process not only enriched teachers' knowledge of lesson planning and EF-focused learning management but also improved their practical teaching skills. This may be attributed to hands-on teacher training, which deepened their understanding of EF skills and diversified their teaching strategies. Additionally, the researcher facilitated knowledge exchange among teachers through an online social network via the LINE application. Teachers shared EF activity techniques, and the researcher provided continuous support through on-site visits, friendly mentoring, and ongoing online discussions. This collaborative approach effectively strengthened teachers' skills in designing EF-based learning experiences for preschoolers.

Parental involvement was emphasized as an essential component, given that the emotional capabilities of young Children are significantly influenced by their primary caregivers. At home, parents are encouraged to help create a conducive learning environment and work collaboratively with the school to reinforce executive function (EF) development in daily contexts. This includes memory recall, delayed gratification, emotional regulation, attention to tasks, and the ability to follow daily routines. EF development is achieved through practical learning experiences within the family context. As Kwanfah et al. (2019) stated regarding the importance of the home in coordinating cooperation with schools, parents and teachers should exchange information to understand children's development and learning. Cooperation is vital for achieving shared developmental goals, fostering a sense of belonging and shared ownership. Such collaboration enhances children's emotional stability and behavioral appropriateness, helping them live happily in society. This research engaged parents in the EF development process alongside teachers by involving them in discussions, activities, observations, and real-time assessments. The approach emphasized mutual reflection and aligned with the objective of building EF skills through enjoyable, cooperative learning between homes and schools. Teachers were thus empowered to support students' brain development effectively.

The results of enhancing EFs in preschool ethnic children after instructions were given showed that most students had EF skills at a good level, and when comparing the average scores before and after instructions, there was a statistically significant difference at the 0.05 level. The EFs scores after teaching and learning management were higher than before teaching because preschool children received enrichment and stimulation of their frontal lobes through various activities. They were able to develop brain skills in terms of 1) working memory, 2) inhibitory control, 3) cognitive flexibility, 4) attention, 5) emotional control, 6) self-monitoring, 7) initiation and action, 8) planning and task completion, and 9) goal-directedness. With the support and development of EFs, children will learn more happily and effectively, setting them up for success as they enter adulthood. According to Thai Health Promotion Foundation (2017) EFs development should occur in a joyful, trusting environment with supportive stimuli like books and toys. Children should learn through hands-on experiences, patience, task completion, and responsibility at home with parental cooperation. Teachers should guide children in emotional regulation and self-reliance. Hence, the EFs-based learning experience in this study was multifaceted and involved strong parental collaboration. Walaiporn and Preeyapron (2022) also supported the idea of effective communication and genuine involvement of capable parents in school activities, recognizing their important role and responsibility from beginning to end.

Teachers were enriched and gained knowledge and skills to develop good brain skills in preschool children. This is consistent with research by Anongnat, Suchanad, and Bantita (2023), which emphasizes enhancing EF skills as essential for nurturing sound decision-making in early childhood. EF skills do not develop naturally without guided practice and appropriate support. Additionally, aesthetic-based educational programs that incorporate EF frameworks have demonstrated positive effects on children's decision-making development.

This study assessed EF development through authentic observations and behavior recording during both home-based and school-based activities. The children's EF-related behaviors were monitored and documented over time. As a result, preschoolers exhibited improvement in their EF skills after the intervention. The data gathered from this research offer valuable insights into when and how children can be trained in life management skills that influence their academic, professional, and daily functioning for effectively entering adulthood. Conversely, EF deficiencies can result in personal and social dysfunction. In a nutshell, EF skills are vital and must be cultivated from early childhood for children to become healthy, independent, and responsible members of society.

## 8. Conclusion

The teacher empowerment curriculum, developed as a tool to enhance EFs in ethnic preschool children attending Thailand's Border Patrol Police Schools, has an Index of Consistency (IOC) between 0.80-1.00. This indicates that all aspects of the curriculum evaluation are of high quality (validity higher than the specified criterion of 0.50). Furthermore, teachers demonstrated good skills in both lesson planning and instruction, being able to set appropriate objectives according to the preschool learning context. The EF content was suitable for preschool children, and teachers were able to create age-appropriate learning atmospheres that encouraged student participation at every stage. Teachers who applied the curriculum with preschool children found most students after learning had good EFs (T-scores 56-60), accounting for 58.95%. When comparing the average EFs scores before and after teaching, a statistically significant difference was found at the 0.05 level, indicating that EFs were higher after teaching than before.

# 9. Suggestion

## 9.1. Suggestions for Applying Research Findings

It is important for teachers to actively participate in the development of EFs and understand the connection between setting goals for teaching and learning activities, defining activities, and systematically assessing EFs. This will help achieve the development of EFs in early childhood.

- 2) Participatory enhancement of EFs to improve the quality of life for ethnic preschool children in Thailand's northern Border Patrol Police schools was carried out using the principle of EFs enhancement, which requires collaboration between teachers and parents. To achieve this goal, school administrators should support teachers in organizing platforms for information exchange and knowledge enhancement between parents to foster mutual understanding and collaboration efforts for their children. Parents should be involved in the process from the beginning to ensure the successful participatory enhancement of EFs for improving the quality of life of early childhood children.
- 3) In teaching and learning management, teachers should attentively focus on the learners, allowing children to learn collaboratively, work together, and exchange knowledge to stimulate EFs. This will enhance children's skills in areas such as working memory, inhibitory control, cognitive flexibility, sustained attention, emotional control, self-monitoring, initiation, planning and organizing tasks, and goal-directed persistence. For impact evaluation, emphasis should be placed on reliable assessment to effectively develop EFs in preschool children.

## 9.2. Suggestions for Future Research

- 1) There is a need to expand research focused on factors affecting the participatory enhancement of EFs to improve the quality of life for ethnic early childhood children.
- 2) Further research should be conducted on the relationships between administrative factors affecting students' executive functions in schools and other educational institutions
- 3) Additional research should be conducted on enhancing EFs to improve the quality of life of early childhood children in other student groups, such as those with special needs or at other grade levels, to enhance children's learning quality.

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