



Play with Butterfly: Case Study of Project-Based Learning in Thammissalam Preschool Thailand

Ari Kusuma Sulyandari (1st); Mutiara Sari Dewi (2nd); Abeedah Rodtian (3rd)

^{1,2}Universitas Islam Malang, Indonesia; ³Thammissalam Preschool Thailand

[1ari.kusuma@unisma.ac.id](mailto:ari.kusuma@unisma.ac.id), [2mutiara.sari@unisma.ac.id](mailto:mutiara.sari@unisma.ac.id), [3Got.arbubaka@gmail.com](mailto:Got.arbubaka@gmail.com)

Corresponding Author: Ari Kusuma Sulyandari – ari.kusuma@unisma.ac.id

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Abstract

This article explores the role of play in early childhood education, specifically in the context of project-based science learning at Thammissalam Kindergarten in Thailand. Playing is considered important because it helps develop children's concentration, creativity, motor skills, and cognitive development. Project-based learning is seen as an effective approach to integrating science education into the curriculum, stimulating children's critical and creative thinking. This research uses a qualitative, case study type. Data was taken at Thammissalam Kindergarten, Thailand. We made observations on children in Thammissalam Thailand when the project was carried out. We conducted interviews with teachers and the headmaster about this project. This project was carried out for 1 year. The result of this project is that children understand scientific and cognitive processes because they know the growth of butterflies from the beginning of metamorphosis. Children learn to manage their emotions because they understand that this project will not last for a short time. They also learn cooperation because butterflies need a home. They prepared it all. The project can be implemented in the classroom in stages, for example, when children see caterpillars, they will learn about caterpillars, what caterpillars eat, and how caterpillars move to practice gross motor skills. Maybe it could be researched more deeply about evaluating the long-term effects of project-based learning on child development. Measuring the lasting impact of project-based learning on children's cognitive, social, and emotional development over the longer term. It can also be related to technology. Explore how technology can enhance children's engagement and learning in a project context. It can also be researched further on the differences between using technology and not.

Keywords: project-based learning; preschool; Thailand

Introduction

The benefit of playing for young children is that it increases concentration because playing is a child's nature. Children learn language, physical motor skills, creativity, and cognitive development through play (Allee-Herndon et al., 2022). The length of time young children spend playing shows how much they enjoy it. Children's growth, physical development, communicative development, and energy flow are all influenced by play (Wardhani, 2023). Play is where children create their world. It is evident in daily life that children prefer to play to study. As learning occurs naturally at a young age, we ought to support kids' play-based learning. Children who play not only have happier lives, but their personalities, attitudes, and character can also develop. Children should play since it will provide them with knowledge that will aid in their development and improvement. Playing is a joyful activity that can be done freely, without pressure, or focus on results. Rather, playing is about an acquired process that is good for a child's development in all areas.

The learning experiences that come from seeing, copying, and repeatedly performing easy activities in their surroundings will have an impact on every child's potential and intelligence (Charara et

al., 2021). Because of this, it takes a lot of work to support children's development by offering learning and educational opportunities that are suitable for their stage of development, requirements, and preferences. Children are essentially immediately connected to science through the natural processes that surround them. Children should be introduced to science through enjoyable and regular activities starting at a young age. This is done to help kids understand how the science projects they are working on perform. Children can undertake easy science experiments to learn about the mechanisms behind phenomena and the reasons behind them. Furthermore, play-based approaches have been found to support the literacy learning needs of students, particularly those from low socioeconomic backgrounds, and can contribute to educational equity (Andrade, 2019).

The goal of the activity can be met in part by how teachers increase the science literacy of their students. The methods used don't always work as planned. Therefore, there are strong reasons why a teacher should select specific instructional techniques to increase students' motivation, curiosity, and creativity (Torkar & Rejc, 2017). Since science is more than just a book of ideas, facts, and concepts, it is the science that investigates natural events. This is a process of exploration as well. In addition, science gives opportunity for kids to apply these concepts to real-world situations and helps them learn about themselves and the natural world. Overall, play in kindergarten provides a holistic and effective approach to support children's social, emotional, and cognitive development, and it should be valued and incorporated into early education settings (Allee-Herndon et al., 2022). Science does not have to be finished in a single experiment in a short period. Learning is just one of the many stages that make up the hard science process. Project-based learning, a method of instruction where projects become the main subject of study, can be used to study science (et al., 2023). Its goal is to teach kids how to ask questions and do research to find answers to difficult problems. To attain learning outcomes—skills, attitudes, and understanding—this technique also helps kids become better at exploring, analyzing, synthesizing, and interpreting data. a teaching strategy that creates a "constructivist" learning atmosphere where kids can grow as knowledge producers (Taylor & Boyer, 2020).

Many schools pursue student achievement. They don't think about the child's long-term perspective. Pursuing reading, writing, and counting is necessary. Moreover, foreign language programs such as Arabic or English. If everything is done through the playing process. Children will be enthusiastic about learning. Because learning at preschool is a process. So adults must be patient in accompanying them. because everything cannot be done instantly. The results of pre-research observations and interviews are that several cases that occur, such as gadget addiction in children, slow speech, and hyperactivity, can subside with project learning. Children focus on their respective tasks. study outside and solve problems.

The ASEAN nation of Thailand is distinguished by its own culture. Since the Thai government is committed to enhancing education, emphasis is placed on early childhood education. The Thai government runs several programs, one of which is English language instruction; however, how this is carried out primarily depends on school policy (Pholphirul et al., 2023). Arabic is also used by some in Thailand's private Islamic schools. In Thailand, there are three different kinds of schools: international, private, and public. Public schools are mandated to hire a specific number of foreign teachers annually and are typically financed by the government. You can make your lesson plans and teaching materials at private language schools, and you may have more flexibility to modify your teaching methods to suit the needs of your students. Private language schools typically offer greater flexibility in terms of curriculum and teaching hours (Thong Thinwiang, 2022).

At Thammissalam Kindergarten in Thailand, project-based learning focuses on a single theme—animals. They studied butterflies for a year as part of a project-based learning experience. Kids collect

specific kinds of caterpillars, such as those that live in plants, and watch the transformation process until the caterpillars turn into butterflies. They are certain to experience disappointment, like a dead cocoon or caterpillar. Children can learn about the causes and consequences of this. Why does it pass away? Youngsters' critical thinking skills will function and solve the issue. Because every project includes a problem-solving component that enables kids to use all of their skills to finish, project-based learning can help young kids become better problem solvers. This project-based learning can be done on schedule and helps young children develop better problem-solving skills by creating habits. It is seen to be crucial that scientific education take place in a pleasant setting to foster children's imagination, creativity, motor skills, language, cognitive, social, and emotional development, and religious and moral ideals Princess (2017).

Method

This research is a qualitative case study (Sugiono, 2010). This research was conducted at Thammissalam Kindergarten in Thailand. The thing studied is the implementation of project-based learning programs. Implementing play-based science learning in kindergarten, children's science learning, playful processes to cognition and linguistics, as well as findings. The effectiveness of project-based learning combined with development for children. we used three different data sources—observations, interviews, and documentation. Student data taken for observation was 15 to 20 students. Data taken during observation is child development including cognitive, language, social-emotional, and physical motor skills. data is taken when children do projects. This project lasts 1 year. We also made observations on teachers in class. how they teach. How do they read project material in class? We also conducted interviews with teachers and school principals about the importance of this project. Photos were also recorded to strengthen the data results. This research is focused on finding out how project-based learning is implemented at Thammissalam Preschool. The learning process reaches the final results of the project. Also to find out how much influence it has on children's development.

Result and Discussion

Children Play

Officially established on August 8, 1967, the Association of Southeast Asian Nations (ASEAN) is a political and economic alliance of nations in the Asia-Pacific area. Currently, 10 nations make up this organization: Singapore, Thailand, Vietnam, Malaysia, Myanmar, Brunei, Cambodia, Indonesia, Laos, and the Philippines. As the foundation upon which AEC can develop, expand, and thrive, education is essential to the success of this integration. With a focus on education, the ASEAN Socio-Cultural Community Blueprint aims "to encourage the establishment of an ASEAN Socio-Cultural Community (ASCC)" (ASEAN Secretariat, 2009: p. 1). Following directives from the ASEAN Secretariat, Thailand's Ministry of Education devised a four-year plan to get ready to become a fully integrated nation. Cooperation and implementation in schools are key components of the Ministry of Education's plan (National Office of the Education Commission, 1998). According to the ministry, its approach is crucial to child-centered education. Educational directors and administrators are accountable for making sure certain procedures are followed. Thus, administration is crucial to the creation of government policies, particularly those about education (Panit, 2005). Probably the most important thing that administrators can do to support the ASEAN community in their schools is to include ASEAN Studies in the curriculum (Niyom, 2005). To prepare schools in Northeastern Thailand for social and cultural access to the ASEAN Community, the researchers devised this investigation by taking into account knowledge management formats and models. This was done in light of the importance of education in preparing Thailand for entry

into the AEC. Due to their differentiation as a basis for education and their disregard for national education standards, kindergarten courses were the main focus of the inquiry.

We found something interesting at the Thammissalam preschool. Children don't just learn Arabic and English. They learn to be independent and take care of themselves. Like grabbing lunch. Clean up lunch and brush your teeth after eating. Children can learn to be patient and control their emotions because during pre-research observations we discovered different learning methods. Children are given physical motor stimulation before entering class. They ran in place cheerfully. Then enter the class with initial activities. After they complete the assignment from the teacher. Children are stimulated to move imitating caterpillars. The project learning carried out was about the metamorphosis of butterflies. They were involved in everything from looking for plants to observing caterpillars becoming butterflies. The project was carried out for one year. And all that time the children patiently observed the process. In this case, project-based learning is very important, because it has a significant impact on children's development. Even though they apply it outside class hours. However, teachers can bring this to the classroom. Teachers integrate projects into the classroom and learn together. Discussed in detail and well. According (Wiyani, 2022), the learning that has been designed can run with the support of the Head Master. The Head Master is a leader and educational manager. He is required to facilitate teachers in preparing lesson plans. And the spirit of learning independently. Head Masters must ensure that the learning activities organized by the teacher can run according to plan. Then the Head Master carries out monitoring. Monitoring activities produce various alternative solutions to overcome problems in learning. The Head Master gives teachers the freedom to choose one or several of the alternative solutions. This was done in the spirit of independent learning. In implementing learning, the spirit of independent learning is realized through play activities.

Teaching young children can be a difficult task that calls for the patience, imagination, and self-control of the teacher. For those who have been positively touched by educating young children, it is also an enjoyable one (Millburn, 2016). Youngsters are eager to discover new things. For them, everything is brand-new, and even simple education may be enjoyable for young learners. However, teaching a kid a language other than their mother tongue in a foreign country can be a laborious task for educators (Perry, 2001). The preschool curriculum in Thailand differs from other countries in several ways. Firstly, Thailand emphasizes the importance of creativity in preschool education, with a focus on developing children's understanding and appreciation of creativity (Ra-ngubtook, 2011). Additionally, Thailand has integrated STEM education into early childhood education since 2006, aiming to lay fundamental skills and promote STEM learning experiences for young children (Udomtamanupab, 2020). Furthermore, Thailand has implemented a new curriculum based on the HighScope approach, which has shown positive impacts on child development in multiple dimensions (Promkatkeaw, 2022). These differences highlight Thailand's commitment to providing a well-rounded and holistic education for preschool children, with an emphasis on creativity, STEM learning, and child development. Researchers create attention to project-based learning at Thailand's Thammissalam Kindergarten as an alternative to STEM-based education. Children can witness scientific concepts during the metamorphosis process, but the activity, which involves gathering plants and caterpillars until they become butterflies, is completed outside of school hours. Education is invariably connected to the task at hand. Children will leap into place at the beginning of the class, and then form a queue to mimic a caterpillar walking with friends. Researchers conducted interviews and found that play had a highly positive effect on children's development.

Table 1. Interview with the teacher in Thammissalam Preschool Thailand

| No | What | Development | How |
|----|-------------------------------|----------------|---|
| 1 | When do children play freely? | Physic motoric | Children play freely during their breaks after brushing their teeth. For the boys they play |

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|---|---------------------------------------|--|---|
| | | | football, while the girls look at the butterfly project. |
| 2 | Do children play in class? | Physical motor and cognitive. | Yes, children play games in class such as imitating a walking caterpillar, jogging, and sometimes drawing freely. |
| 3 | What is the benefit of play for kids? | Physical motor, language, and cognitive. | - There is one child who is addicted to gadgets, the longer he can be free from the gadget, he dares to play with friends, focus on looking the other person in the eye, and talk to other children. - Children can participate in learning calmly and are not noisy in class because they are satisfied playing |

From Table 1 above, playing can develop aspects of children's development. Play has a positive impact on the social, emotional, and cognitive development of kindergarten children. It helps children learn self-control, emotion regulation, communication, conflict resolution, and other important skills (Schmidtke, 2022). Play also enhances children's social skills, such as communication, interaction with others, cooperation, and expression of feelings (Andrade, 2019). Additionally, play-based settings in kindergarten support children in forming their own cultural identities and contribute to their overall development (Salama, 2018).



Picture 1. Kids Play Soccer in the Yard.

Source: Personal Documentation

Play not only enhances physical abilities and cognitive development but also serves as a means of psychotherapy and improves social interaction skills (Pui et al., 2020). However, there is a dilemma as academic demands have led to a decrease in playtime in kindergarten (Wu, 2023). Despite this, research shows that play is beneficial for children's learning and well-being (Picture 1).

Implementing Play-Based Science Learning in Kindergarten

Implementing play-based science learning in kindergarten can be beneficial for children's development and learning Pyle (2023). It allows children to experience and recognize physical laws in a self-directed and playful manner (Niu, 2023). Play-based learning can stimulate critical and creative thinking skills in children (Maulia & Kurniati, 2022). However, it is important to consider the gendered effects of play-based learning, as play contexts can perpetuate gender inequalities (Glauser-Abou Ismail et al., 2022). Some play settings may implicitly propagate patriarchal values and uphold gender divisions, which can negatively impact girls' experiences in play (Prioletta, 2023). Therefore, there is a need for critical gender literacy and transformative action among early education stakeholders to ensure that play-

based learning is inclusive and equitable. The 1st profile saw play and learning as separate constructs and reported challenges meeting academic demands using play-based learning. Their students primarily engaged in free play. The 2nd profile believed that play could support academic learning and that teachers play an important role in play. Their students engaged in 5 different types of play, situated along a continuum from child-directed to more teacher-directed. *Practice or Policy*: The continuum of play-based learning provides a broader and more concrete definition of play-based learning to help teachers implement this pedagogical approach and enhance the study of play-based learning in early years research (Angela, 2017).



Picture 2. Headmasters and Teacher Principals Explain Projects to Students
Source: Personal Documentation

The learning project at Thammissalam Kindergarten in Thailand takes the theme of butterfly metamorphosis, seen from picture 2 and picture 3. The project was carried out over a period of one year. Metamorphosis affects the cognitive and emotional growth of children by providing opportunities for learning and self-expression. Through activities that involve observing, asking questions, and using visual arts, children can deepen their understanding of the metamorphosis process and explore relationships between different stages of development and their environment (Haque & Indah, 2022).



Picture. 3 Plant Project for Caterpillars
Source: Personal Documentation

The youngsters began the project by bringing plants and placing them in tents. Next, they searched for caterpillars (Picture 4).



Picture 4. Caterpillar

Source: Personal Documentation

The plant is covered by the caterpillar. And materialize into a cocoon. To allow kids to keep an eye on the creatures' growth, all the science components are housed under a clear tent. A butterfly emerges from the cocoon when the instructor and the kids alternatively water the plants to keep them from dying. Additionally, through the process of watering plants, children can develop social skills. They can interact with their peers while engaging in gardening activities, establishing collaboration, and accomplishing their responsibilities together (Marinho-Casanova & Leiner, 2017)

The principal of the school assisted in guiding the kids as well, beginning with gathering caterpillars. They search for caterpillars that can survive on the plants that others collected because different kinds of caterpillars prefer to eat different kinds of leaves. Kids get to choose the kind of animal they want. This is how science is taught. This interaction and collaboration can help children develop positive relationships, improve their emotional intelligence, and learn to work together as a team (Khulusinniyah, 2023). Overall, the process of watering plants can foster social skills and a sense of responsibility in children, while also teaching them about the importance of nurturing and caring for living things (Chen et al., 2014).

Children also think, how can a cocoon live? How to prevent plants from dying? What to do? The teacher divides the children's pickets to water the leaves in the pots. Watering plants can contribute to the development of social skills and responsibility in children. By giving children the responsibility of watering plants, they learn that plants need water, food, and nurturing to grow, just like they do. This teaches them the importance of taking care of living things and being responsible for their well-being (Oliveira & Messeder, 2019). So that the butterflies don't go anywhere, the project area is placed in a transparent tent. This engagement in the learning process enhances their cognitive development and critical thinking skills. Additionally, the creative self-expression involved in art production allows children to communicate their ideas and emotions, fostering their emotional growth and self-awareness (Giles, Rebecca M, Baggett, Paige V, Shaw, 2009). By actively participating in the study of metamorphosis, children can develop a sense of curiosity, wonder, and appreciation for the natural world, which further contributes to their emotional and cognitive growth (Jacquilyn Brinkley Griffin, 2022).

Children's Science Learning

A school in Thammissalam According to the notification made by the Thai government, STEM is used in kindergarten. Science can be studied on projects or outside of the classroom. This isn't meant to derail the ideas the kids are learning (Picture 5). Children still benefit from science even though project-based learning takes place outside of school hours since, of course, schools follow a monthly theme. Children's science learning has several benefits. It helps develop logical thinking skills, observation, and experimentation (Wiguna et al., 2023). Science learning in early childhood stimulates children to explore their environment, reflect on their observations, and make discoveries through science activities (Andari et al., 2022). Integrating science learning with STEAM (Science, Technology, Engineering, Arts, and Mathematics) approach enhances holistic learning, develops 21st-century skills, and increases children's interest in science (Preetha et al., 2022). Science education also improves children's attitudes toward science, making it more relevant to their lives and expanding their views of science beyond traditional notions (Trott & Weinberg, 2020). Participating in science learning programs can lead to greater confidence, participation, and achievement in school science, as well as increased interest in pursuing STEM careers (Roostin & Swandhina, 2019). Overall, science learning in early childhood contributes to the cognitive and physical motor development of children and provides them with a foundation for understanding the world around them.



Picture 5. Explore Caterpillar
Source: Personal Documentation

Children's science learning is an important aspect of their development, helping them to explore and understand the world around them (Husna & Yaswinda, 2023). Science learning can be implemented through various methods such as project-based learning, simple science practices, and interactive videos Gelir (2022). These approaches aim to enhance children's science process skills, logical thinking, observation, experimentation, and creativity (Ying Xu; Julian Levine; Valery Vigil; Daniel Ritchie; Shan Zhang; Trisha Thomas; Carlos Barrera; Michelle Meza; Andres Sebastian Bustamante; Mark Warschauer, 2023). Teachers play a crucial role in structuring science activities and introducing scientific concepts explicitly to children. Science learning in early childhood can be integrated into various activities such as making fruit satay, outdoor classes, and introducing the solar system. By providing meaningful interactions with media characters and using conversational technologies, children can actively engage and learn from science-focused videos. Overall, science learning in early childhood is essential for cognitive and physical motor development, and it can be facilitated through various methods and approaches.

Additionally, project-based learning modules have been found to enhance young children's scientific practices, regardless of their age or ethnic background (Farida, 2021). Integrating play into project-based science curricula can also benefit students' social, emotional, and cognitive development, while still meeting disciplinary learning goals (Hsin & Wu, 2023). However, implementing certain aspects of project-based learning, such as driving questions, student-led inquiries, and the integration of central

content, may pose challenges (Markula & Aksela, 2022). Overall, project-based learning can be a valuable approach to science education in kindergarten, promoting both scientific skills and holistic development.

Playful Processes to Cognition and Linguistic

Play in kindergarten has been found to have cognitive benefits for children. Research suggests that play-based approaches, when combined with direct instruction, can support the literacy learning needs of all students, including those from low socioeconomic backgrounds (Allee-Herndon et al., 2022). Integrating play with content, such as in a project-based science curriculum, can help students access and understand scientific concepts, promoting science practice, ideas, and crosscutting concepts (Charara et al., 2021). The application of play methods, such as block play, has been shown to improve cognitive abilities in early childhood, including shape recognition, letter recognition, and exploratory activities (Aprianti & Nafiqoh, 2020). Play also contributes to children's social and emotional development, helping them learn self-control, emotion regulation, communication, and conflict resolution (Andrade, 2019). Additionally, play supports children's language development and physical development, including fine and gross motor skills and coordination (Kadusi & Stan, 2016). Children are given opportunities to think critically through this project-based scientific education. Kids will wonder how caterpillars survive. Why do butterflies die? Do they have hunger? And how does the caterpillar transform into a butterfly and chrysalis? And in summer, what do plants and caterpillars need? Do butterflies have a thirst? The child is thinking about these simple things. They are searching for cause and effect, which is unimportant. Thus, this project was completed from the start.

Exposure to scientific concepts and inquiry methods has been found to have a positive impact on a child's cognitive and academic growth. Research has shown that teaching science through inquiry-based methods, rather than traditional lecture methods, can significantly improve students' inquiry skills (Faroq, 2023). Additionally, early childhood science education has been found to contribute to children's cognitive development, with the effective use of educational programs, teachers, learning environments, and teaching methods being crucial (BAYAR, 2023). Furthermore, the emergence of scientific misconceptions in children can be better understood by examining rule-based learning in other areas of child development, such as overextension, overregularization, and over-imitation (Hast, 2021). Moreover, training parents to guide their children using scientific inquiry-based approaches in informal learning settings can encourage children to participate in more joint scientific conversations, leading to increased scientific content in their responses (Chandler-Campbell et al., 2020). Overall, exposure to scientific concepts and inquiry methods can enhance a child's cognitive abilities and academic growth.

Exposure to scientific concepts contributes to language development in children by shaping their beliefs and engagement with science. Language that uses noun labels and generic descriptions to discuss people who do science promotes essentialist beliefs and leads to disengagement from science among young children. Additionally, the acquisition of scientific concepts is considered important for child development, and play is seen as a social construction factor of learning in childhood (Hast, 2021). The concept of science in early childhood programs includes the recognition and mastery of scientific material, which involves facts, theories, concepts, and problem-solving (Wang, M. M., Cardarelli, A., Leslie, S.-J., & Rhodes, 2022). Teachers play a crucial role in loading aspects of the nature of science in the learning process, but their understanding of science concepts may be limited (Sandini et al., 2023). Therefore, providing teachers with a clear understanding and mastery of science concepts for early childhood can reduce misconceptions and promote accurate scientific understanding.

Conclusion

In conclusion, the article underscores the significant role of play-based approaches and project-based learning in early childhood education, particularly in fostering children's cognitive, social, and emotional development. Through activities such as project-based science learning at Thammissalam Kindergarten in Thailand, children not only engage in hands-on exploration but also develop critical and creative thinking skills. The integration of play into the science curriculum enhances children's understanding and appreciation of scientific concepts while promoting holistic development. Furthermore,

the article highlights the importance of providing teachers with a clear understanding of scientific concepts to effectively convey material to young learners. Overall, the article emphasizes the importance of play and science education in laying the foundation for children's lifelong learning and development. A follow-up to the research is that researchers can conduct longitudinal studies to evaluate the long-term effects of project-based learning on child development. Measuring the lasting impact of project-based learning on children's cognitive, social, and emotional development over the longer term. It can also be related to technology. Explore how technology can enhance children's engagement and learning in a project context. It can also be researched further on the differences between using technology and not.

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