



Promoting young children's creative thinking, social skills, and attention using guided play and loose parts

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Abstract

According to child initiation, guided play is more effective than free play due to adult support. When implemented with loose parts that are open-ended materials, guided play can enhance the learning of young children. This research aims to investigate the effects of integrating guided play with loose parts on preschoolers' creative thinking, social behavior, and attention. Participants are divided into 2 groups: outdoor learning and indoor learning. Group 1 consists of 97 boys and girls from 3 private preschools. Group 2 consists of 50 boys and girls aged 3–5 years old involved in the Let's Play Together Project. This research is comprised of 3 observation areas: social behavior, creative thinking behavior, and attention. Both a pre and post-test are used to collect data. Then, the data is analyzed using frequency, percentage, mean score, standard deviation, and *t*-test. Results demonstrate that preschoolers in Group 1 gained higher mean scores for creative behavior, social behavior, and attention than before, at the statistical significance of .05. However, Group 2 achieved high mean scores for creative and social behavior only, at the statistical significance of .05. It is noted that applying the 3 steps of arranging loose parts activities i.e., the preparation, group or individual play, and reflection can promote young children's development and learning.

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Introduction

The “Four Cs” of 21st century learning include collaboration, communication, critical thinking, and creativity. These abilities must be developed beginning in

the early years of life in order for a person to be prepared to face future challenges (Chiruguru, 2020). Playful learning, adult interaction, peer interaction, and learning are crucial factors that lay down the foundation of 21st century skills (Battelle for kids, 2019). Hence, creative thinking, social behavior, and attention are the main characteristics that are highlighted in this research. All these so-called soft skills are needed to prepare young children for the future world.

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In Thai society, children lack both space and time for free play at home and at school. They are expected and encouraged to learn according to the suggestions of adults, either parents or teachers (Chinsangthip & Khayankij, 2022). As a result, children lack opportunities to express their thoughts, emotions, and feelings. Thai social values believe that a ‘smart child’ is a child with the ability to read, write, and calculate numbers. Child learning, therefore, is limited to a set framework rather than allowing the freedom to do or express: Thai children often become stressed and lack creative thinking (Poomkornsarn, 2021; Sarakitprijia, n.d.). Thus, play is seen to be vital as the main learning vehicle in the early years.

It is noted that an adult can support a child’s learning while the child enjoys playing in the role of a play leader. This type of play is called ‘*Guided Play*’ in which a child is a leader with adult support in the context of free play. The adult gives guidance or supports the child to learn different concepts and skills. Guided play is more effective than free play as it helps the child learn to achieve the goal set by the adults who facilitate learning by setting a structured environment i.e., setting appropriate media and areas as well as using open-ended questions for stimulating the child’s thinking. The child still has the freedom to play and to select what to play with, according to his/her desire. The child is encouraged to play via guidance given or suggested for him/her to achieve the learning goal. The balance between a child’s free play and adult support is a key success of guided play (Weisberg et al., 2016; Weisberg & Zosh, 2018).

According to Flannigan and Dietze (2017), and Sukardjo et al. (2023), a variety of open-ended materials foster young children’s imagination and unstructured play without adult dominance. As mentioned by Nicholson (1971), “*loose parts*” is defined as surrounding a child with materials or things in daily life, which a child can pick up, carry, or move: all can be blended, applied, or redesigned as play materials in unlimited ways. As such, equipment can be moved, assembled, or separated in various forms. The types of material used include natural materials, wood, plastic, steel, ceramics/glass, clothes, or packages. Loose parts are used in various activities for a child to play actively through exploration, experiment, and building. Such activities promote the child’s imagination, creative thinking, and development of motion and hand-eye coordination as well as the development of collaborative play in groups (Casey & Robertson, 2017).

According to the systematic literature review of Gibson et al. (2017), there is little evidence regards the

effects of playing with loose parts concerning the various dimensions of cognitive, emotional, and social development of children. Most studies have been focused on the benefits of physical development. This study aims to explore the effects of integrating guided play with loose parts in two different contexts: outdoor play within a preschool context and indoor play within a home learning context. The study also concentrates on the influence that loose parts play under adult guidance on preschoolers’ creative thinking, social skills, and attention behaviors, which are important characteristics of children in the 21st century.

Literature Review

Herein, a framework of research has been developed by synthesizing concepts, which can provide guidelines for arranging loose parts for young children. Thus, the emphasize is on materials children are familiar with, within the living context, allowing children to be part of the process, using an interdisciplinary approach, and creating a clearing house to inform knowledge within the community (Nicholson, 1971). The principle of guided play is such that adults provide a structured environment that includes materials, equipment, a safe space, and open-ended questions that allow children to be play leaders and make decisions (Weisberg & Zosh, 2018). The optimum learning relationship is comprised of seven principles to enhance the learning potential of children, including being present, preparing a positive psychological environment, allowing children to face challenges, practicing deep listening, using children’s cues to guide responses, being open to the unexpected, and reacting to the new way (Mendizza & Pearce, 2001). Loose parts activities can be arranged in three steps. Step 1 is preparation. Step 2 is free play in groups via inspiring, planning, creating, and tidying up. Step 3 is learning reflection, which leads to the higher development of three types of behavior: creative thinking behavior, social behavior, and attention behavior.

Creative Thinking

Creative thinking is the ability through which a preschooler can think in daily life by relying on three components: time, materials, and space (Kiewra & Veselack, 2016). Creative thinking as studied by Fumoto et al. (2012) can be promoted through four bases, which include social, cognitive, emotional, and motivational basis. Thus, Robson (2014) proposed a conceptual

framework for observation instead of using a test in order to examine behavior, which reflects the creative thinking of 3–5-year-old children. Creative behavior was divided into three categories: exploration, participation and enjoyment, and persistence. Observation focused on the children's activities all day. This conceptual framework was used as a guideline for teachers to support children's creative behavior as well as to help improve the teachers' role when interacting with the children.

Social Behavior

Children, before reaching the age of six, need to possess social competence in communicative skills, collaboration, ownership, participation, empathy, and self-control; otherwise, they will be at risk in various aspects when they grow up. Teachers, parents, or caregivers need to observe and monitor children's interactions and give chances for them to solve their own problems without intervention. Accordingly, children will develop social competence, confidence, and self-independence in doing something by themselves. Adults should not help them too quickly, except in the case of children with frequent problems in dealing with social situations. Thus, adults need to use various strategies in helping children to overcome such limitations. The structure for observing the social behavior of 3–5-year-old children consists of four aspects: (1) social play i.e., play behavior in the order of beginning, intermediate, and high levels such that an older child at a higher level of play behavior will not express play behavior at a lower level, (2) basic characteristics, (3) emotional awareness, and (4) communicative skills (Anderson, 2013; Illinois Early Learning Project, 2005; McClellan & Katz, 2001).

Attention

Attention or attention span is a key in learning success of a child. Attention refers to the ability to concentrate on something in a certain period without distraction by other things as well as the ability to exclude other stimuli such as sounds, images, or information. When a child grows up, his/her attention span becomes longer according to age. A child's attention span is about 6–9 min at the age of 3, 8–12 min at the age of 4, 10–15 min at the age of 5, and 12–18 min at the age of 6 (McIlroy, 2018). The attention of a kindergarten child can be measured when the child pays attention to do something to achieve the goal. The time when a child

pays attention to do something is recorded from the start to the end of that activity i.e., not more than 15 min. For a 5-year-old child, a mark + is recorded if the attention span lasts 1 min or a mark 0 is recorded if the attention span lasts less than 1 min. Then, the results are used to calculate the percentage of attention span (Wuthipanyarattanakul, 2012).

Methodology

Participants

This research was comprised of a one-group, pretest-posttest quasi-experimental study. The target group was divided into two groups, according to two different contexts.

Group 1: Outdoor loose parts play consisted of 97 boys and girls at the age of 3–5 years studying onsite in three private preschools. These participants included 28 preschoolers from School 1, 20 preschoolers from School 2, and 49 preschoolers from School 3. The preschool teachers were informed about the play through the online orientation.

Group 2: Indoor loose parts play consisted of 50 boys and girls at the age of 3–5 years who were involved in the Let's Play Together Project with their parents. These participants were 18 3-year-old preschoolers, 15 4-year-old preschoolers, and 17 5-year-old preschoolers. Parents applied to join activities by themselves through online registration on Facebook.

Research Tools

Quantitative data were gathered from three observation forms validated by three experts in Early Childhood Education (ECE), as described below.

1. Observation of creative thinking behavior comprised a frequency record of three categories of behavior: exploration, participation and enjoyment, and persistence (10 items). A mark + was recorded when each behavior appeared. When such behavior did not appear, mark 0 was recorded. The Index of Congruence (IOC) was 1.00.

2. Observation of social behavior comprised a frequency record of three categories of behavior: social play, emotional regulation, and communication (10 items). A mark + was recorded when each behavior appeared, whereas mark 0 was recorded when such behavior did not appear. The Index of Congruence (IOC) was 0.95.

3. A record of attention span incorporated a frequency record of attention while preschoolers were joining art activities and storytelling time. A mark + was recorded when a preschoolers' attention span lasted 1 min whereas a mark 0 was recorded when their attention span lasted less than 1 min. The Index of Congruence (IOC) was 1.00.

Qualitative data were gathered using a semi-structural interview via a Zoom meeting with parents. Questions discussed included: What did you do as a co-player? Describe a “wow” moment after implementing the 3 steps of loose parts. Describe a new understanding or insight. What's next? What will you do? How would you appreciate being a co-player for your child? What changes would you make? What are your thoughts. For preschool teachers, questions discussed included: How do young children respond to the outdoor loose parts play?

Data Collection

Data collection was carried out as follows.

Group 1: The loose parts plays were managed outside classrooms using the three steps of loose parts activities. The class teacher arranged the outdoor loose parts play as extra activities outside the regular class timetable, by following the researcher-designed lesson plans for 12

sessions of 60 min each. In **Figure 1 (A and B)**, materials included kits of loose parts for outdoor activities. In **Figure 2 (A and B)**, a handbook “*Sue Len Sang*” (media, play, and creation) as well as three books of the story series ‘*Let's Play Together*’ were provided by the researcher. Data were gathered before and after the experimental period by the researcher and the research assistants (4 people altogether). During free play, data were gathered through observation about creative thinking behavior and social behavior. During art and storytelling activities, the attention span of children was observed.

Group 2: Loose parts plays were arranged at home, followed by the three steps of loose parts activities. Parents supported the plays by using materials prepared and sent by the researcher. In **Figure 1 (C and D)**, materials included kits of loose parts for indoor activities. In **Figure 2 (A and B)**, a handbook “*Sue Len Sang*” (media, play, and creation) as well as three books of the story series ‘*Let's Play Together*’ were provided by the researcher. Before the experiment, parents collected the data and submitted their results to the researcher through Google Forms after arranging play activities for the children at home for 12 sessions of 60 min. The activities were performed according to the researcher-designed activity plan at the parents' convenient time. The parents joined online meetings with the researcher twice during the experiment and submitted the results to the researchers after completion of the experiment.

Data Analysis

Qualitative data about children's learning were collected. For group 1, preschool teachers were interviewed. For group 2, data were elicited from parents' reflections on a closed social media platform as well as group reflections via an online Zoom meeting. Content analysis was used to analyze the data. Quantitative data from the observation on creative thinking behavior and social behavior were analyzed into frequency, means, standard deviation, and *t*-test. For the observation on attention behavior, data were analyzed into percentage, standard deviation, and *t*-test.

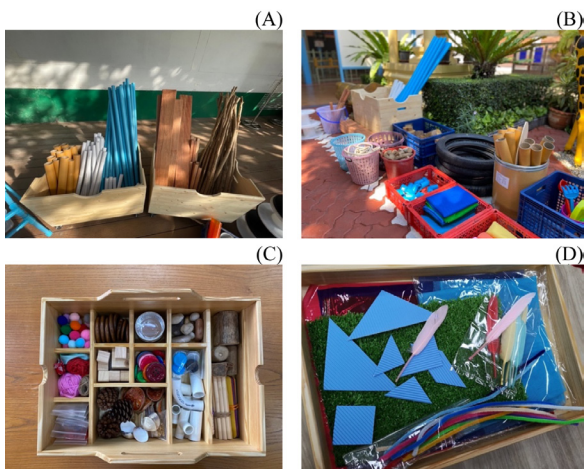


Figure 1 Illustrations of loose parts materials: (A) and (B) Outdoor loose parts kit, and (C) and (D) Indoor loose parts kit



Figure 2 Story series: (A) ‘Let Play Together’, and (B) Handbook ‘Sue Len Sang’

Results

Creative Thinking Behavior, Social Behavior, and Attention of Group 1: Outdoor Loose Parts play

After the experiment, overall, the mean scores of creative thinking behavior and social behavior, and the average percentage of attention behavior were higher than before the experiment, attaining a statistical significance of .05. The aspects with the largest mean score differences were *Exploration* in the aspect of Creative thinking behavior and *Communication* in the aspect of Social behavior (Table 1).

Summary of the Qualitative Data

1. Creative thinking behavior

Regarding *Exploration*, 3-year-olds usually played by exploring and touching familiar materials. 4-year-olds explored and touched various types of materials and invited friends to explore them together (the 5th time). 5-year-olds challenged themselves to explore unfamiliar materials. About *Participation and Enjoyment*, the preschoolers of all ages expressed trial-and-error behavior by trying out the use of new methods to play with various materials, adapting playing methods, and expressing flexible thinking. In terms of *Attention*, most preschoolers expressed attempts to build, add, or invent things by themselves with more bravado than at the first time. When preschoolers did something successfully, they called their friends or the teacher to admire their success such as by smiling or jumping with happiness at their successful tasks as well as telling their parents about their play at school.

“Children at all ages show the behavior of trial-and-error; they find new ways of playing loose parts...”

Preschool teacher.

2. Social behavior

It was found that 3-year-olds showed basic playing behavior by inviting friends to play together (7th time). 4-year-olds showed playing behavior at the intermediate level. 5-year-olds displayed playing behavior at a higher level with more structured plays in later sessions by setting rules and outlines conforming to the stories. Regarding *Emotional Regulation*, preschoolers of all ages expressed better emotional regulation, were able to control their dissatisfaction, were communicative, and attempted to solve problems by themselves. 4-year-olds expressed acceptance of emerging changes and were more flexible to flow with the situation: sometimes with the teacher’s guidance to solve problems. 5-year-olds increasingly listened to their friends’ opinions and helped each other to solve problems without the teacher’s assistance. About *Communication*, the preschoolers conversed together more. At the initial phase, 3-year-olds mostly communicated through non-verbal language, but they increasingly used verbal language after they learned more words from playing with loose parts. 4-year-olds and 5-year-olds demonstrated higher communicative skills, had more opinions, were eager to think and speak, and learned to ask for help and to say thank you or sorry.

“...Loose parts play increases vocabulary; children aged 4 and 5 gain more communication skills, become confident in expressing their opinions, know how to ask for help, say thank you, or say sorry...”

Preschool teacher.

3. Attention behavior

During play, most preschoolers focused on creating, constructing, discovering, seeking, and experimenting with materials to create various objects influenced by stories. 3-year-olds paid attention to all three books, while 4-year-olds and 5-year-olds showed an interest in

Table 1 Pre-test and post-test comparison of mean and standard deviation for creative thinking behavior, social behavior, and attention of the preschoolers in group 1

Scale	n	Pre-test		Post-test		t	p
		M	SD	M	SD		
Creative thinking behavior	97	13.16	8.119	17.77	12.279	-3.354	.001*
Exploration (E)	97	5.60	2.441	7.81	5.028	-4.302	.000*
Participation and enjoyment (I)	97	4.53	4.120	5.82	4.763	-2.429	.017*
Persistence (P)	97	3.03	2.942	4.13	4.375	-2.111	.037*
Social behavior	97	21.96	17.950	31.97	27.711	-3.280	.001*
Social play	97	9.13	8.123	11.55	8.337	-2.309	.023*
Emotional regulation	97	5.03	5.945	7.72	8.023	-2.652	.009*
Communication	97	7.80	6.457	12.70	14.276	-3.509	.001*
Attention	97	71.03	7.357	84.33	4.728	-7.285	.000*
Listening to stories	90	73.27	3.704	82.47	3.055	-3.844	.000*
Arts activities	84	85.53	2.429	89.20	2.059	-1.835	.070

Note: *p < .05.

books 2 and 3. This behavior indicated the state of flow while the teacher took the role of an observer or guide at times. Such attention resulted in preschoolers' increased concentration, and continuous attention in the regular classroom activities.

"...Most children focus on the construction, exploration, seeking equipment, and experimentation of creating things using their imagination without being easily distracted..."

Preschool teacher.

Creative Thinking Behavior, Social Behavior, and Attention of Group 2: Indoor Loose Parts play

After the experiment, the overall mean scores of *creative thinking behavior* and *social behavior* were higher at the statistical significance of .05: average percentage of *attention* did not change. In Table 2, the aspects with the largest mean score differences were *participation and enjoyment* in the aspect of *creative thinking behavior*, and *emotional regulation* in the aspect of *social behavior* (Table 2).

Summary of the qualitative data

1. Creative thinking behavior

Regarding *exploration*, preschoolers paid attention to novel materials by expressing excitement and encouragement, revealing their imagination as related to their background experience. Preschoolers used various senses to explore and observe materials. At the initial phase of exploration, preschoolers asked short questions and were keen to join new activities. They shared their thoughts through storytelling, trial and error, and building things from the stories. For *Participation and Enjoyment*, preschoolers used new planning and problem-solving methods by applying background knowledge or thinking up new ideas through imagination or assumption. Such behavior indicated their flexibility and initiative in thinking. In addition, preschoolers collaborated with friends or adults in creative plays or activities by

communicating ideas, convincing others, or accepting other people's ideas. In terms of *persistence*, they showed risk taking behavior: daring to make decisions, trying out new things, thereby learning from mistakes. They also showed awareness of their own thoughts and ability to control their emotions by doing activities continuously despite facing difficulties, challenges, or uncertainty.

"...He used imagination with loose parts i.e. the spider felt like it fell from the tree, so he did first aid on it; the animals were sick because they played outside for too long, so he prepared medicine for them..."

Mother of 3y 8m boy.

2. Social behavior

As for *Social Play*, preschoolers could build and maintain relationships with other children. The phenomenon of social play included playing alone, playing with others, understanding others' feelings, and communicating with others. Regards *Emotional Regulation*, preschoolers successfully managed negative emotions. When playing enjoyably or encountering pleasant things, they expressed satisfaction by smiling and laughing. With adults' advice, preschoolers were able to solve problems through play and expressed their own desires. In terms of *Communication*, they communicated by using short questions such as 'What's this?', and "Why do Pom Poms have 2 colors in the same ball?" etc. They spoke about their play and invited others to play with them. Having a limited vocabulary, 3-year-olds could not answer questions well as they did not understand the meanings of words in the stories or were not familiar with loose part materials such as vines, pine cones, and dried bael fruit.

"Unbelievable! The twins shared loose parts together and expressed positive interaction; they played together for 3 hours without quarreling. They're happy; it seems like they both slip into their world."

Mother of 4y 4m girls.

Table 2 Pre-test and post-test comparison of mean and standard deviation on creative thinking behavior, social behavior, and attention of the preschoolers in Group 2

Scale	n	Pre-test		Post-test		t	p
		M	SD	M	SD		
Creative thinking behavior	50	42.66	33.482	67.20	48.344	-4.524	.000*
Exploration (E)	50	15.34	12.489	23.84	17.874	-3.971	.000*
Participation and enjoyment (I)	50	17.32	15.152	26.40	21.220	-3.747	.000*
Persistence (P)	50	10.00	7.982	16.96	12.594	-4.681	.000*
Social behavior	50	121.34	104.513	191.90	167.053	-4.194	.000*
Social play	50	42.36	42.886	66.14	66.070	-3.698	.001*
Emotional regulation	50	35.78	35.306	62.78	57.224	-4.038	.000*
Communication	50	43.20	38.811	62.98	53.735	-3.505	.001*
Attention	50	83.33	4.673	84.73	6.964	-0.400	.691

Note: *p < .05.

3. Attention behavior

Preschoolers' attention developed while they played. When they paid attention to loose parts, preschoolers' attention increased. With the support of adults, preschoolers paid more attention during play having continuous concentration.

"...using varieties of materials to create different shapes and forms, he was in a state of flow and focused during play..."

Mother of 4y 9m boy.

Discussion and Recommendations

Integrated guided Play with Loose Parts Improve Preschoolers' Creative Thinking Behavior, Social Behavior, and Attention

After loose parts activities, preschoolers in Group 1 showed higher Creative Thinking behavior, Social behavior, plus Attention. However, preschoolers in Group 2 showed higher scores only in Creative thinking behavior and Social behavior. This means that integrating guided play with loose parts can promote preschoolers' Creative thinking and Social behavior since they deal with open-ended activities and media which stimulate them to use their imagination and creative thinking. These results agree with the study by Houser et al. (2016), who noted that loose parts are highly flexible and can promote variety in children's play: to build something, perform drama, survey something, and play with collaboration. This study corresponded to the findings by Sukardjo et al. (2023), which reported that playing with loose parts can enhance children 4C's skills.

It is noted that Group 1, when engaged in playing with outdoor loose parts, gained the highest mean scores for *Communication* and *Exploration*. These findings correspond to a study by Flannigan and Dietze (2017), who reported that outdoor loose parts promote social interaction, language use, risk-taking, and inclusivity of gender and age. Moreover, loose parts in large sizes for outdoor play can stimulate teamwork and participation during play, resulting in more communication among the children. Similarly, according to Daly and Beloglovsky (2015, as cited in Smith-Gilman, 2018), loose parts can enhance open-ended play through the variety of resources and materials, and can promote thinking ability via creation, conversation, and collaboration in various forms.

As for Group 2, their mean score for Attention remained unchanged. This outcome may be due to their greater concentration at the pre-experimental stage, and their involvement in activities through a one-by-one format with close support from adults. When doing activities in

a familiar context, they are not easily distracted. As a result, the average percentage for Attention after the experiment was higher but without statistical significance. However, Quality Classrooms (2022) stated that loose parts help children to be more focused and more engaged in their play. With parental support, overseeing loose parts play at home, further research into preschoolers' activities can be carried out.

Assembly of Loose Parts Materials to stimulate Thinking to solve Problems and build Motivation to play

It is acknowledged that the story series of '*Let's Play Together*' is open-ended for stimulating children to think extensively and solve problems without definite correct answers. According to Ülger (2016), the factors of imagination and creative thinking, problem-solving thinking, and critical thinking have a great effect on children's creativity. Besides, storytelling can expose children to the experience of language and expand their lexicon. Similarly, at the initial stage of activities, children's exploration of the seven novel types of material in the loose part boxes can stimulate their motivation and encourage them to play. This research is consistent with a study by Fumoto et al. (2012), who found that the fundamental aspect of internal motivation can affect children's creative thinking: children can perceive their freedom to choose what to do according to their desire, leading to self-value. To compare the influence of indoor and outdoor loose parts on children's play in a variety of early childhood settings such as preschools, home learning, or community center, further studies can be conducted, being worthwhile.

Guided Play is helpful for Parents to understand Their Children with Less Expectation

It is noted that participation in the '*Let's Play Together*' activities enable parents to attentively observe their children with open-mindedness: by listening and being less judgmental. Through such activities, family relationships are improved and parents gain a better understanding of their children's nature, aptitudes, and learning styles. During such learning activities where both adults and children are involved, learning proceeds at full potential and flows.

Playing under an atmosphere full of love, trust, and safety can lead children to an internal process of the flow state and attention. Thereby, children can develop in language, social skills, empathy, imagination, ability to understand other people, self-control, and can express thinking skills through play under adults' guidance. Such a positive psychological environment leads to enjoyment and pleasure with less stress, resulting in greater understanding and value of play in childhood (Mendizha & Pearce, 2001).

Limitation of the Study

This research was done using a one-group design. However, a study should be validated using a two-group design. In collecting data for this research, due to social distancing measures for preventing the spread of COVID-19, parents had to be the data collectors. Therefore, this made it difficult to control the reliability of the observations. Qualitative data obtained from both teachers and parents were used to support the changes in children's learning behavior. To conclude, further study needs to be undertaken and should be done by setting up a play group in a children's laboratory wherein data can be assembled by researchers. How adults affect young children's play with loose parts is of paramount importance. How best adults can help children reach their full potential is a perennial question: not easily resolved.

Conflict of Interest

The authors declare that there is no conflict of interest.

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