

Development of 5 Dimensions of the Basic Mathematic Skills for Early Childhood by Creative Art  
Activities for Learning in the Private School in Sai Mai District, Bangkok

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**Abstract**

This research was to develop the basic mathematic skills for early childhood by creative art activities for learning and compare the basic mathematic skills for early childhood before and after organizing creative art activities for learning. The sample group of this study was 15 students in Kindergarten 3 for the academic year 2018 of the private school in Sai Mai District, Bangkok by the purposive sampling method. The research instruments were the lesson plan of organizing creative art activities for learning and basic mathematics test by using One–Group Pretest–Posttest Design. The research was analyzed by means, standard deviation and t-test Dependent Sample.

The result showed that development t of the basic mathematic skills for early childhood after organizing creative art activities for learning had effects on overall basic mathematical skills and basic mathematical skills by dimensions with higher means and at the high level. Comparing before and after testing, the students had better scores of the basic mathematic skills at the statistical significance level of .01.

**Keywords:** Mathematics, early childhood, learning

**Background**

At present, mathematical experiences for early childhood have been provided through various instructional methods. The research result found that some people applied the instructional methods to develop the basic mathematic skills for early childhood, such as, mathematical storytelling activities to enhance the basic mathematic skills for early childhood. Kwabbuch Boonyuhong (2003) stated that arts helped the children to communicate and integrate the existing experiences and children could integrate knowledge of science, society, mathematics and Thai into arts to express their feelings. The children learned from environment independently. Art media is a natural form to express and lead to children's learning and the world understanding, which causes them to develop and create from the image transfer into the learning arts in both aesthetics and content learning. Arts will be the core of development because children can express their feelings according to their cognition obtained from the learning procedure through arts. Young children need touch and stimulation from environment (Kunlaya Tantiphacheeva. 2001a:35). Art learning is the activity which children can touch, express their thought and convey to others.

Moreover, arts is an entertaining activity to promote learning mathematical skills, the skills which can be inserted into all art activities, and one activity to encourage children to survey and provide opportunities for children to use their initiative and imagination. These will lead the children to possess

significant characteristics, such as, rationality, being observant and learning, if a teacher stimulates to be learning. The research by Kunlaya Tantiphlacheeva 3 (2003) found that arts could be managed for learning and divided in to 6 types as follows: 1. repeating arts called learning repetition through arts, 2. transfer arts called learning transfer as arts, 3. image adjustment arts called learning adjustment as arts, 4. transforming arts called transforming what is learned into art work, 5. integrating arts called learning integration into arts, 6. searching arts called searching knowledge from arts. The study of creative art types for learning revealed that transforming arts, integrating arts and searching arts can be applied to develop the mathematical skills. The transforming arts refer to changing what is learned to create the art work by transforming and selecting to create the art work. The integrating arts refer to applying the acquired knowledge as the foundation of developing the art work into image or invention by observing, comparing and counting the number, then adding and decorating according to imagination. The searching arts refer to using arts, such as, picture or art work for the children to search for knowledge and stimulate learning. For each type of arts, children often need to use the basic mathematic skills, such as, comparing, classifying, observing, telling positions, counting, understanding value of the number, or increasing or decreasing the number. Therefore, the researcher considered that this should be tested to study if it could develop the basic mathematic skills for early childhood and the research result. How to organize creative art activities for learning will be a guideline for applying innovations for instructional management for early childhood to develop the basic mathematic skills for early childhood or applying to develop other skills for early childhood.

### **Objectives**

1. To develop the basic mathematic skills for early childhood by creative art activities for learning
2. To compare the basic mathematic skills for early childhood before and after organizing creative art activities for learning

### **Research Methodology**

**Population** used in this research was 420 young children in Kindergarten 3 in the first semester for the academic year 2018 of the private school in Sai Mai District, Bangkok.

**Sample group** used in this research was 15 young children in Kindergarten 3 in the first semester for the academic year 2018 of the private school in Sai Mai District, Bangkok by the purposive sampling method.

### **Variables**

1. Independent variables were types of creative art activities for learning.

2. Dependent variables were 5 dimensions of the basic mathematic skills, i.e., 1. telling positions, 2. classifying, 3. verbal counting 1 – 30, 4. understanding value of the number 1 –20, and 5. increasing or decreasing the number 1 – 10.

#### **Research Instrument**

1. The plan of organizing creative art activities for learning
2. The basic mathematics test by creating the plan of organizing creative art activities for learning

#### **Experimental Method**

1. The researcher evaluated the basic mathematic skills for early childhood (Pretest) before testing with the sample group for 5 days, that is, Monday, Tuesday, Wednesday, Thursday and Friday for 45 minutes per day.

2. The researcher conducted the experiment by organizing creative art activities for learning with the sample group for 45 minutes by testing 5 days a week and 45 minutes per day during 09.00-09.45 a.m. from June 25, 2017 to September 25, 2017 with the 12-week experiment period.

#### **Data Collection**

The researcher collected data from the basic mathematical skill test for early childhood. The researcher conducted the basic mathematical skill test for early childhood (Pretest) before testing and the basic mathematical skill test for early childhood (Posttest) after finishing the experiment to compare the development of the basic mathematic skills for early childhood.

#### **Data Analysis**

Compare the development of the basic mathematic skills for early childhood before and after organizing creative art activities for learning by using t-test Dependent Samples.

#### **Conclusion**

1. Young children who received the organization of creative art activities had mean score, overall basic mathematical skills and basic mathematical skills by dimensions, i.e., telling positions, classifying, verbal counting 1 – 30, understanding value of the number, and increasing or decreasing the number 1 – 10 at the high level differing from before testing at the statistical significance level of .01 and with higher means.
2. Young children who received the organization of creative art activities had better development of all dimensions of the basic mathematical skills than before testing at the statistical significance level of .01.

#### **Discussion**

This research was to study the results of creative art activities for learning towards development of the basic mathematic skills for early childhood of Kindergarten 3 students in the private school in Sai Mai District, Bangkok. The results were as follows:

1. Young children who received the organization of creative art activities for learning after testing had development of the basic mathematical skills differing from before testing at the statistical significance level of .01.

1.1 Learning stimulation refers to using stimulus to stimulate learning in accordance with the desired content for the students, persuading the students to think and monitoring by using questions, conversation, discussion, observation or searching. In this research, the researcher stimulated learning by using teacher's questions, media, pictures, games, stories or situations for the students to express their opinions independently and exchange opinions through conversation. This resulted in the next stage of learning corresponding with Phenchai Ngiab-prasert (1999:101) stating that teaching for learning the basic mathematical skills was to teach from what children had experiences or what children met. This was learning from concrete experiences and doing by themselves which led children to understand and learn more quickly.

1.2 Filtering to concept was a stimulating stage for children's reflections by connecting the knowledge children have learned with new things corresponding with Kunlaya Tantiphacheeva (2006:39) mentioning that mathematics was a concept which young children learned from physical perception and led to logical thinking, the logic specifying relations, rationality and concept development.

1.3 Developing through art activities referred to the stage of applying arts to clearly develop learning. The teacher assigned the children to transfer knowledge, understanding or the learned content by doing creative art activities according to the art types agreeing with learning objectives. Children could convey their knowledge, understanding, and imagination into the art work in all 3 types of creative art activities for learning that is, transforming arts, integrating arts and searching arts to transfer each dimension of the basic mathematical skills. Kunlaya Tantiphacheeva (2004:189) stated that creative art activities were the activities to provide opportunities for children to survey and do experiments with creative art equipment which helped to develop the concept of general science and mathematics from observing, evaluating pictures, and organizing art activities. The teacher should give advice or tell children slightly to give them chances to work as needed and independently.

1.4 Concluding the learned content was the final stage of creative art activities for learning to make conclusions. Asking questions is probably applied for children to review knowledge, understanding and the learned content from the art work. Children and the teacher concluded what have learned together corresponding with the research by Panida Chatayapha (2001) stating that young children who received the organization of creative art activities to provide chances for the children to convey their thought independently, have conversation, ask questions, what they met, and apply to create the art work. This will result in developing preschool children's communication. In the research, the researcher let the children to conclude the learned content in groups and present in front of the class. In this stage, children had

interaction together, expressed opinions, discussed knowledge acquired from learning and made conclusion in groups, creating the identical concept.

2. Developing the basic mathematical skills for early childhood who received the organization of creative art activities for learning

2.1 Skill of telling positions was one of the basic mathematical skills for early childhood with the ability of telling positions of things, such as, above-below, in-out, north-south, left-right, front-middle-back and between. The results of the organization of creative art activities for learning in each stage were the activities to provide chances for children to use skills of observation and comparison, and understand mathematical meaning. The research result from the searching type was the type which could best develop skill of telling positions. Children enjoyed participating with activities corresponding with Poungrat Poomkacha (2002:18) stating that mathematics for kindergarteners was to organize significant experiences, provide chances for children to express their mathematical knowledge and understanding, search for intellect and learn by themselves happily.

2.2 Skill of classifying referred to the ability to observe, classify and compare things similarly or differently in terms of quantity, size, form, color and shape which required skill of observing by using five senses of children to learn from various media corresponding with Yaowapa Techakup (1999:107) mentioning that arts were a guideline for helping children to express their ability and thought into the picture.

2.3 Skill of verbal counting was the ability in counting the number in sequence. Nitaya Praphruitkit (1998:26 – 27) mentioned that counting was considered the first of numeral mathematics the children have known. However, the ability to memorize number did not mean children always understood the meaning because children who could count number probably used memorizing number continuously. Children's counting will be more reasonable after having understanding, being able to use the number, and understanding the principles of connecting number with things because children will mainly use this method.

2.4 Skill of understanding value of the number referred to the ability to writing and telling value of the number and the ability to sort in descending order or ascending order. The researcher observed that to be able to understand value of the number, firstly children needed to understand number and counting and then they will be able to compare more or less things. Therefore, in organizing creative art activities for learning, children have to get real experiences of daily-life mathematics. To enhance understanding by using the transforming arts for developing experiences agreed with Phenchan Ngiab-prasert (1999:9) stating that organizing experiences and activities centered on children to provide chances for them to build knowledge and skills, foster them to search and solve mathematical problems and knowledge as the basis, and apply to their daily life. In case of comparison of inequality, children needed to understand mathematical meaning in comparison.

2.5 Skill of increasing or decreasing the number 1 – 10 referred to the ability to increase or decrease things from the existing number. The research result of skill of increasing or decreasing the number 1 – 10 was the mathematical skill to be developed at the very high level. After the research, children had better understanding and knowledge of skill of increasing or decreasing the number and could be applied. Activities of creative art types for learning to develop skill very well from the experiment agreed with Phenchan Ngiab-prasert (1999:9) who mentioned that building knowledge and skills to foster children to search and solve problems enjoyably, learning each skill of children will be repeated with each type of arts from transforming arts, integrating arts and searching arts. These will enable children to do and think. Testing with good grade students also showed the same result. Children had development at the very high level at the statistical significance level of .01.

#### Research Recommendations

1. Activities of creative art types for learning should be studied in other kinds for organizing activities for children to develop skills of science, society, Thai language, etc. differently according to the learning types, such as, repeating arts, image adjustment arts, transfer arts, transforming arts, integrating arts, and searching arts to study differences.
2. Activities of creative art types for learning should be applied to organize activities for developing creativeness among girls and boys to find differences in using the same type of art activities.
3. Differences of doing creative art activities between real media and simulated media should be studied and compared about self-esteem of young children in doing arts for learning.

#### References

- Kunlaya Tantiphacheeva. (2002). *Types of Early Childhood Instruction*. Bangkok: Edison Press Product Co., Ltd.
- \_\_\_\_\_.(2004c). *Handbook of Organizing Creative Art Activities for Learning*. Department of Early Childhood Education. Faculty of Education. Srinakharinwirot University. Photocopied.
- \_\_\_\_\_. (2006, April). Teaching Mathematics for Early Childhood. *Thai Journal of Early Childhood Education*. 10(2): 38–45.
- Panida Chatayapha. (2001). *The Process in Developing Preschool Childrens Communication Through Whole Language Approach with Story Construction in Creative Art Activities*. Thesis. Master of Education (Early Childhood Education). Bangkok: Srinakharinwirot University. Prasarnmit Campus. Photocopied.
- Poungnat Poomkacha. (2002). *The development of mathematical ability in kindergarteners learned through mathematics stories*. Master's Thesis. Chulalongkorn University. Photocopied.

Phenchan Ngiab-prasert. (1999). *Mathematics for Early Childhood*. Faculty of Education. Phuket Rhajabhat University.

Saraphee Chompookham. (2009). **Result of Developing Basic Scientific Skills of Kindergarten 2 Students by Developmental Concept and Brain-based Learning**. Master of Education's Thesis (Curriculum and Instruction). Mahasarakham: Graduate School, Mahasarakham University.

Unchalee Saiyawan. (2010). **The Comparative Study of Experimental and Mixed Experience Management towards Skill of Scientific Procedure for Early Childhood**. Master of Education's Thesis. Bangkok: Graduate School, Srinakharinwirot University.

Bruner, J.S. (1961). *The Process of Education*. Harvard University Press Cambridge Massachusetts.