

## **Insight stories: Looking into teacher support in enhancing scientific thinking skills among pre-school students**

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**Abstract.** Due to the revision of the National Pre-School Standard Curriculum (KSPK) 2017, the strengthening of Science and Technology Support and STEM integration early childhood education in Malaysia is now being aggressively developed in line with national education policies. This case study is conducted to find out how pre-school teachers apply science process elements in their teaching and learning activities. Observation was carried out on a pre-school teacher during a lesson in one of the national pre-schools in Tawau. Observation findings show that pre-school teachers understand the need for early science education though they lack the knowledge and application of the scientific skills. Therefore, it is highly recommended for pre-school teachers to improve appropriate pedagogical practices, and support the early process of science in early childhood education by contextually emphasizing and linking their teaching to the 21st century curriculum.

**Keywords:** *Early childhood education, Scientific thinking, STEM Implementation.*

### **1 Introduction**

The importance of upgrading quality in early education is a necessity and it give a great impact to the future of the country. National Pre-School Standard Curriculum (KSPK, 2017) is reviewed according to the requirements of the Education Development Plan (PPPM 2013-2025). KSPK was formulated based on the principles of Proper Practice with the Development of Children (ABP) and the theory of children's learning. The criteria for selecting activities gives priority to enriching experiences, engaging, safe, fun and KSPK (2017). The main aspect was crucial and it emphasize the development and challenges of today's dynamic educational changes and demand teachers make a totally paradigm shift towards upbringing quality in their teaching strategy.

In relation to improving the quality of education at the early stage of childhood, STEM education has become a priority focus in early education

through science and technology education. The STEM elements are developed by applying the integration through the curriculum used in early childhood education in Malaysia. Through early science in Science and Technology Standards in early curriculum, its emphasis on the formation of attitude and science process skills is the key focus for children at pre-school levels. Science-based learning activities that emphasize the concept of early science processes can nurture children with science and generally explore the STEM environments and integrated it in the learning trends set out in the early childhood education curriculum, (Mazlini Adnan et al., 2016). Enhancing student ability towards early science in early stages is essential for young children because it helps them understand the world around them and creates awareness towards their life in micro level and macro level, (Oliver, A, 2006).

### Background Studies

Teachers role in promoting early science skills towards children learning. In order to promote this skills, teacher knowledge of the concept and understanding in science especially in early basis approach in STEM can encourage science skills and learning by experiential learning (Settlage. J & Souther, S. S. 2007). Encouraging the quest for science education should start from early childhood education. Early science education is important as it will help children to understand what is happening in the environment and to help them with the reasoning issues. Eshach and Fried (2005) explains good observations in the early concepts of science at an early stage affecting scientific thinking in children.

Following the reinstatement of KSPK (2017) STEM education integration in teaching and learning was fully applied in pre-school teaching and learning process. Making sure interest towards early science understanding is undeniably helped by the support from the teacher itself. It encompasses the conceptual science of teachers in this subject of science and technology. Bylee.R (2006) stated that learning science is important and should be emphasized in the current education transformation and have to be equivalent to the speed of progress in high demanding in STEM education. With good science mastery, reasoning, creativity and innovation processes can be developed in the soul of the students.

This process will lead to the resolution of the problems faced by society and this is important to ensure the welfare of citizens of a country and world in a wider concept. Scientific processes should be emphasized to ensure that children are able to build blocks of knowledge in their minds and they are able to interact, build rapport networks with their peers, teachers and their environment, Conezio, K & French.L (2002).

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## **2. Methodology**

The aim of this study was to understand and find out from teacher view about and practices of their practices in supporting preschool students ability towards scientific process skill. This study was designed as a case study, Creswell (2013) stated that case study can be defined as a qualitative research type including data of collection such as observation, interview, documents analysis in order to find out or to understand the cases. In order to understand and find out the main objective in this study was carry out in one of national preschool at Tawau district and 25 preschools involve during science activities according to the time table in preschool. Data analysis consisted of portraying all the data related to observation during teaching and learning session . Organizing and preparing data, making general scene of information, coding, describing, representing and interpreting were used to make analysis and interpretation all the data collected (Creswell 2013).

## **3. Results and Discussion**

### **3.1. Designing of the learning media**

An early scientific experience can help children recognize and understand their surroundings. Children naturally have high curiosity, with this opportunity and space to be encouraged and indirectly so that this scientific skill can be nourished from the beginning. Several issues have been identified in the delivery of early teaching and learning of science in preschool and kindergarten.

From the observations found that teachers are still lacking in mastering the basic science of pedagogy in depth, especially in learning activities which focuses on scientific skills such as observation, comparison, classification, evaluation and communication. Even though teachers have highlighted projects related to science activities, the emphasis aspect in the science process is still poorly applied by teachers.

Teachers need to be creative in selecting effective teaching methods and in accordance with the interests of children. The environment and teaching aids that encourage science learning are also influential in stimulating the process of scientific thinking among children. The appropriate learning strategies show it can boost children's excitement towards learning science is shown in the picture below.

Scientific processes should be emphasized to ensure that children are able to build blocks of knowledge in their minds and they are able to interact, build rapport networks with peers, teachers and the environment, Claudia Eliason.L.J (2008). The concept of scientific process should be mastered

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first if it is to make the activities of pursuit and learning become more fun and meaningful to children. This scientific process can be combined with the creativity of teachers and children in early scientific activities.



Figure 1. Its gardening time



Figure 2. Our Kangkung



Figure 3. Discussion session with Miss Wia

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Teacher role as facilitator can make early learning of science become effective and meaningful to children. The use of worksheet is also found to be a tool that must be present in the teaching and learning activities. It is found that this activity only emphasizes on baseline identification but does not define conceptualization of projects undertaken by teachers. Settlage and Southerland (2007) states that the adoption of good science process skills among children provides a solid foundation in skills in inquiry and investigation that leads to critical thinking.



Figure 4. What is it? Tell me please

Encouraging learning which emphasizes on the interest and eagerness to learn. Learning means includes curriculum and a supportive environment for children enthusiastic and add interest to the learning itself (Morrison, 2009).

#### **4. Conclusion**

At the early stages of science and STEM education teachers should provide a safe, appropriate environment in the teaching and learning process. This includes encouraging children to a scientific basis and providing a real experience for children to learn science in fun and able to discover creativity and innovation since childhood.

Conventional teaching and learning should be avoided so that children do not get bored, rigid in learning because the negative effects will make scientific skills in children erased from the learning process. Practicing scaffolding techniques can help teachers in planning early science activities, child-rearing responses to teacher guidance with the use of appropriate teaching materials capable of assisting the development of creativity, cognitive, socialization of children.

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Scientific thinking has been built in children since the beginning, (Oliver, A.2006). Meaningful learning experience which emphasis on student participation actively in the actual activities that they can relate to everyday life. Mastery of the basics of learning is a significant keywords in active participation, whereby children will learn to be independent by providing appropriate opportunities to their environment (Sandra 2005).

As educators at the early stage, teaching and learning practices should be in line with the importance of emphasizing basic science skills to be focus by teacher during the implementation of teaching and learning. 21st-century learning element and the application of thinking skills are in parallel with the inculcation of scientific skills in children and thus able to ensure the planning to produce human capital relevant to today's needs.

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