The influence of learning science with constructivist approach towards character building of early childhood

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Abstract The instilling of character values is one of the priorities in early childhood education which can be obtained from science learning. The aspect of science learning, in its essence, is to acquaint children to the natural environment directly or through the other media. This study has a purpose to discover the impact of science learning with a constructivist approach towards the construction of early childhood’s character. This is experimental research with pre-test and post-test. 15 early childhood students of TK Adzkia II, Tabing, Padang are involved in data collection with total sampling and analyzed with the t-test method. It is found that there has been an influence of learning science towards the building of independent, careful and environmental caring characters for early childhood. The result shows that the average score of mastery of students’ character values is higher after being given science learning with a constructivist approach.

1. Introduction
Learning Science in early childhood has been conducted with integrating instructional activities at the centers of early childhood learning. Learning Science in early childhood is a concept of learning carried out in constructivism so that children are able to master the concept of science. The methods of Science for early childhood includes the objects that are around the children and attract their attention, namely air, sound, fire, soil, plants, animals and themselves. Learning science in early childhood is in accordance with the stage of child development [1]. The existence of science learning will be beneficial for children to be able to improve their cognitive and character aspects. Learning science in early childhood focuses on process skills [2]. In this context through the process of science, it is expected that children will be able to shape the character of science that is curious, thorough, honest and able to cooperate. In learning science, children are trained to utilize all their senses in the process of early childhood learning. Constructivism-based science learning is synonymous with learning processes that involve process skills in children.

From what has been obtained in the schools, it is showed that the teachers have not applied the learning science optimally. Many teachers have failed to involve the students in learning science in the process of learning. The involvement of students in positive learning and environmental design will be able to improve the mastery of character in children[3]. Character values will be grown to children according to children's characteristics, meaning that the developmental stages of the character are certainly in accordance with the age of the students. The process of planting character values starts from giving an understanding of values to children, motivating them to do according to the character that is expected to integrate the character in children [4].
In Curriculum 2013, character education has been integrated into all learning activities, especially for early childhood. In this research, the researcher observed the students in TKIT Adzkia II Tabing Padang and found that the children have already had a number of positive characters, such as religious attitudes, for example: using their right hand and praying before starting an activity. However, it was further observed the learning process, meticulous character, a strong sense of curiosity, and discipline were not fully applied in early childhood. The results of the interview with kindergarten teachers in early 2019 showed that in the learning process, it is more dominated by several experimental activities made by the teachers. Children are passively involved in seeing teachers carry out activities. The implementation of learning science involves only a small number of children because the lack of practicum tools, the children are less able to cooperate with others and the teachers are worried that students cannot manage the practice properly. These phenomena will impact the growth of children’s characters in learning science, such as the children will be less independent, less careful, and tend to be unable to cooperate. In connection with this, the learning of science designed in constructivism is believed to increase the mastery of children’s character values.

2. Methods
This is experimental research with giving pre-test and post-test to a group of students. The design of this study is comparing the changes before and after the treatment given to the students. The population is all students in TKIT Adzkia II in Koto Tangah Regency, Kota Padang and using total sampling, involving 15 students of TK B group. The data was collected using observation guidance and interview and analyzed by using t-test and SPSS.

3. Findings and Discussion
Research trials using constructivism approach in learning science are focused on the centers of learning. The stages of learning consist of stages of orientation, the core stages of learning and closing. In the model of constructivism, the curriculum is designed based on children's learning experience. Children learn about contextual facts and concepts through real experience in the field. At this stage, the child learns to identify scientific phenomena found in nature. Science experiments are carried out, namely at the arts center, with the theme: My Environment and the sub-theme is new family members (younger siblings). In the core step of learning, it was conducted several activities, as follows:

| No | Learning Steps   | The analysis of constructivism activities                                                                 |
|----|------------------|----------------------------------------------------------------------------------------------------------|
| 1  | Opening          | 1. In this initial orientation, the teacher introduces and explains to students regarding family, family members, and involve the students to talk about their family members. The students then are instilled with character values, such as environmental care, namely family environment.  |
|    |                  | 2. The children are invited to discover the morning activities before going to school, relating to their environment, such as tidying the bedroom and cooperate with other family members to help the parents maintaining a garden. The character values are independent and cooperative. |
| 2  | The core activities | Students are asked to take a sketch of their family members and color them. The students are invited to select the color by themselves and allowed to combine several different colors to construct their sense of curiosity, meticulous, and persevering. |
| 3  | Closing          | Students are asked to have a discussion about the activities they have conducted. This step will build communicative and flexible characters and are able to express their opinions. |
In the early stages of research design, it was observed the mastery of children's character values. Furthermore, research trials were carried out, namely implementing learning with constructivism-based science learning. Learning is designed using a model of constructivism. This means that children are attempted to construct their own knowledge through scientific activities.

The results of the study show that the data of the mastery of the character values of children are significantly different. The inferential analysis is used to test the hypothesis. This study uses the t-test to examine the hypothesis with a paired sample test in the SPSS program version 17. The results of data analysis at a significant stage of 0.05 obtained $t_{\text{count}} \leq -9.165$, and $t_{\text{table}} 2.97684$ because $t_{\text{count}} < t_{\text{table}}$ then $H_0$ was rejected. Furthermore, it can be concluded that there is the influence of learning science on character mastery in early childhood.

Based on this, science learning is expected to shape the character of the child's personality, which fosters a discipline, curiosity, and care for the environment [2]. Learning science essentially demands process skills in children. All children's activities are designed to involve all senses in children [5].

Science activities which are well-designed in early childhood learning will be able to foster positive character values in children. Through science activities, children can be taught in collaboration with fellow group members. Children are taught to be careful because the experiments involve precision and neatness. Science activities in children will be able to improve cognitive aspects and children's interactions with others [6].

4. Conclusion and Suggestion

4.1 Conclusion

From the discussion above, it is concluded that constructivism-based learning science has a significant impact on the character mastery of early children. It is obtained that $t_{\text{count}}$ equal with $-9.165 < t_{\text{table}} (2.97684)$ at 95% of the confidence interval. Based on the data, it is found that learning in early childhood, particularly in science can increase the mastery of character values of children.

4.2 Suggestion

From the explanation above, it can be suggested some points, as below:

a. The teachers are necessary to implement constructivism-based learning science to improve the mastery of character values in early childhood.

b. The headmaster should provide adequate learning facilities and well-designed learning atmosphere so that learning science can be conducted optimally.

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