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Implementation of STEAM Learning with Magic Puffer Ball for Children with Special Needs

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Abstract

Talenta Kindergarten is an inclusion school in Semarang. Talenta Kindergarten accepts all children without differences in ethnicity, religion, or socio-economic status; even children with special needs can study at Talenta Kindergarten. STEAM learning is considered very effective in early childhood, and Talenta Kindergarten also applies it in learning activities. This study aims to determine the implementation of STEAM learning with magic puffer ball games in Talenta Kindergarten. Descriptive qualitative research is the type and approach of research used in this study. Data from this study were obtained through observation, interviews, and documentation. Then, the data that has been collected will be analyzed using qualitative descriptive analysis. The results of this study show that STEAM learning in Talenta Kindergarten is by the stages of implementing STEAM learning in early childhood. Children can express and imagine according to their wishes to create works. Even with the implementation of STEAM learning with magic puffer ball games at Talenta Kindergarten, children with special needs get much sensory nutrition.

Keywords: STEAM Learning. Games, Magic Puffer Ball.

Introduction

Early childhood education is an effort made to educate children from birth to the age of six. The education is provided by providing stimulation to support children's growth and development, both physical and spiritual. The provision of stimulation aims to prepare children to continue their education to the next level. The right time to stimulate children to reach perfect maturity is when children are in their golden age (Ardiana, 2022). However, if stimulation is not given from an early age by parents, then the development and growth of children will not be by the child's age level (Susanto, 2017). Every child indeed has a different background in life, both cultural and growth. This difference makes them called children with special needs (Daud et al., 2019). Despite the differences, all children deserve a proper education.

STEAM learning can be applied to early childhood. The application of STEAM learning is carried out directly using media around children; both used media and those that are still used as play and learning media. STEAM is a development of STEM that teaches science,

technology, engineering, and mathematics knowledge by adding elements of art to its learning activities. STEAM (Science, Technology, Engineering, Arts, Mathematics) is a learning approach related to several sciences that will support children in improving several skills, including problem-solving skills, thinking critically, and collaborating (Alfirda, 2019).

STEAM learning allows children to imagine and create works according to children's wishes. Before the lesson is carried out, the teacher will prepare an invitation. The teacher prepares the invitation by preparing two to three places containing loose parts (twigs, seeds, shells, stones, leaves, and flowers) (Wardhani et al., 2021). The loose parts are combined with educational games tailored to the day's topic, such as blocks, legos, and magic puffer ball games. When learning occurs, children with special needs arrange a game of magic puffer balls to sit quietly for approximately one hour. The magic puffer ball game requires high concentration to compose from one rubber to another. The magic puffer ball game also requires light power to insert accessories previously arranged on the rubber. The magic puffer ball game is a game that can increase the potential, speed, thinking, and creativity of children. Magic puffer ball is a new game shaped like a rambutan fruit but with a smaller size (Debeturu & Wijayaningsih, 2019). Loose parts are media used for learning through playing with materials that are easy to carry, move, merge, rearrange, separate, and put together again (Wijaya et al., 2020).

Talenta Kindergarten is an inclusion school in Semarang. Talenta Kindergarten accepts all children without differences in ethnicity, religion, or socio-economy, as well as children with special needs. Talenta Kindergarten teaches every child to learn to appreciate and accept the shortcomings of others and create a sense of empathy. The learning program at Talenta Kindergarten is designed by the PAUD curriculum that the national education has set through a learning approach carried out by playing that can develop children's intellectual abilities. The method used in Talenta Kindergarten is the Fun and Active Learning method. Learning at Talenta Kindergarten is carried out through the STEAM learning approach. Children can imagine and be creative according to children's wishes through STEAM learning. The teacher prepares invitations (arrangement of selected and arranged objects) before learning is carried out to attract children's attention to learning. Teachers prepare 2-3 invitations using loose parts (twigs, seeds, shells, stones, leaves, and flowers) combined with educational games, such as blocks, legos, and magic puffer balls. When children with special needs assemble magic puffer balls, children with special needs can sit quietly for about an hour. Arranging one rubber to another requires extra concentration and little energy in combining accessories on rubber that have been arranged before. Children can also combine five competencies at once through the word STEAM.

Based on the description above, researchers are interested in studying more deeply related to the implementation of STEAM learning with magic puffer ball games in Talenta Kindergarten for children with special needs.

Methods

The type and approach of research used in this study is qualitative descriptive research. Qualitative descriptive research is a study that aims to thoroughly determine the phenomena experienced by research subjects, such as behavior, perception, motivation, and so on, through descriptive means in the form of written and spoken words of people and observed behavior (Sugiyono, 2016).

This study obtained data through two data sources, namely primary data and secondary data. Primary data is data obtained by researchers through interviews with respondents. While secondary data is data obtained from respondents indirectly through documents (Arikunto, 2016). Collection techniques are the main step in research to obtain appropriate data (Yusuf, 2014). The data collection techniques used in this study were interviews, observation, and documentation. Then, the data obtained will be analyzed using the descriptive analysis of the Miles and Huberman model, namely data reduction, data presentation, and verification (Hena et al., 2022).

Result and Discussion

Based on the research results, the principal of Talenta Kindergarten revealed that science continues to develop following the dynamics that occur. Therefore, STEAM learning must be applied in Talenta Kindergarten to follow the dynamics in PAUD. Training related to STEAM learning has been carried out by principals and teachers at Talenta Kindergarten in order to prepare children for future lives. According to the observations of teachers at Talenta Kindergarten, STEAM is more able to stimulate children, and children's creativity is also more developed when compared to the learning model previously used, namely the central learning model. Therefore, STEAM learning can be effectively applied to early childhood because STEAM can develop children's understanding of learning materials, collaboration skills, creativity, and communication skills (Putri & Taqiudin, 2021).

Class B teacher at Talenta Kindergarten, Miss Khlara, stated that applying STEAM learning makes children who can solve problems and try something new without fear of failure, confidence, and enthusiasm in everything. Therefore, STEAM learning is applied from an early age because this learning will be needed by children when they grow up to be creative and have imaginations that match their interests. STEAM learning does not provide mandatory targets to be completed on the same day. However, STEAM learning allows children to use their imagination and creativity according to their potential and interests. The teacher is only a facilitator for children to prepare magic puffer ball games and loose parts that will later be used in the learning process. Thus, in STEAM learning, children can explore, imagine, and express themselves to create work according to their wishes and interests (Afina Putri et al., 2021).

Before Talenta Kindergarten implemented STEAM learning, it used the central learning model in learning activities. However, in the even semester 2020, Talenta Kindergarten decided to apply STEAM learning for learning activities. Children become not free with learning centers; for example, when teachers prepare four kinds of games in one day, there are times when children have yet to finish the first game, but children must move to the next game or have to move to another center. This causes the child's curiosity not to be fulfilled. Meanwhile, with

comprehensive STEAM learning, children are given the freedom to imagine as they wish when they create works. STEAM learning is not just a day; it can take more than one day if children still want to know about the topics used in learning at that time.

In this regard, the Principal of Talenta Kindergarten, Miss Ira, stated that the application of STEAM learning to children with special needs is not as complex as imagined because, with STEAM learning, children with special needs get more sensory nutrition through magic puffer balls and loose part games. However, STEAM learning requires teachers to be as creative as possible in preparing learning to attract attention and foster children's interest in participating in STEAM learning. In this regard, teachers not only play a role in teaching, but teachers are also required to be more creative and innovative in preparing learning so that learning becomes fun and can attract children's attention to participate in learning activities (Hidayat et al., 2021).

The STEAM learning approach has three stages in its implementation, and teachers must pay attention to all three stages. The three stages include planning, implementation, and assessment (Maskur, 2018). The following is an explanation of the three stages:

First the planning stage. Planning is an activity carried out by teachers to describe goals when teachers design learning materials and prepare learning media so that children are interested in participating in learning (Sufiati & Afifah, 2019). Teachers' strategies in making lesson plans are to study the Child Development Achievement Level Standard (STPPA) as the final result, learn KD to achieve learning outcomes, and determine learning topics as content so that children have much experience. Before learning activities are carried out, a teacher needs to prepare many things, including compiling RPPH. The RPPH that the teacher at Talenta Kindergarten has prepared needs to be corrected in such a way by the principal, but it is still read, and if there are deficiencies or the RPPH that has been made is not appropriate, the principal will correct it. If, according to the principal, the RPPH made is appropriate, then the principal only gives a signature. The teacher must make a lesson plan before the lesson is carried out, and the teacher must also determine the topic to be used in the lesson, but the topic can be changed according to the child's wishes. Based on the results of interviews conducted with class teachers, it can be concluded that STEAM learning is carried out by compiling RPPH, which is used as a reference for one-day learning activities. In addition, teachers also make invitations before learning activities take place. Invitation is the preparation of selected learning media, which will then be arranged in such a way by the teacher in order to attract children's attention to follow learning (Priyanti et al., 2021). The preparation of the invitation is also accompanied by the provision of provocation sentences aimed at improving children's ability to think. The teacher also prepared books and videos aligned with the day's topic. In line with that, before carrying out learning activities, teachers must compile RPPH that they will use as a reference during the learning activity process. RPPH prepared by teachers refers to RPPM that has been adjusted to the Child Development Achievement Level Standard (STPPA) (Ubaidillah, 2018).

Second, is the implementation stage. The learning process at Talenta Kindergarten is carried out from 07.00-07.15 by the SOP for marching and physical motor activities. At 07.15-07.50, children are grouped according to the religion adopted by each child to be taught worship according to the religion of each child. Children who are Muslims are taught to read istighfar,

two sentences of the shahada, Al-Fatihah, daily prayer, prayer before learning, shalawat nariyah, shalawat badr, and the story of the prophet. At the same time, non-Muslim children are taught how to do good to others by telling stories, singing, and learning about the books adopted by children. At 07.50-.8.00, toilet training and drinking water. At 08.00-09.00, the children return to their respective classes to participate in learning activities with topics of that day. 09.00-09.30, children participate in extracurricular activities except on Monday and Friday.

From 09.30 to 09.55, the children rest and eat together. At 09.55-10.00, SOP goes home. According to the class teacher at Talenta Kindergarten, the application of STEAM learning is beneficial for children to explore and create creations freely according to their wishes without coercion. It must be completed on the same day. STEAM also helps teachers discover each child's potential, and teachers do not overthink learning media because teachers have prepared loose parts and other types of play. Hopefully, children will be able to create their work. The implementation of STEAM learning is divided into three, namely *the initial or opening activity* by the teacher inviting children to sing small and large circle songs, hello, how are you, and songs by the theme to be discussed on that day. Then, the teacher needs to present in the presence and readiness of the child. *The core activities* of STEAM learning are carried out in several stages, but the stages can be carried out independently. The important thing is that all stages are present during the learning activity. These stages include *questioning, exploring and observing, developing skills and processes, communication, and playing*. *The closing activity* with the teacher documented the children's work, which was taken home. The teacher also asks the child what the child feels while playing. In addition, the teacher also evaluates the densest loose part the child is not allowed to touch. Thus, the implementation of learning in the 2013 curriculum is carried out through three stages. These stages include opening or initial activities core and closing activities (Hesti et al., 2022). Likewise, the core activities themselves are also carried out with several stages; these stages are the core learning activities in the 2013 curriculum in PAUD known as 5M, namely Observing, Exploring, Questioning, Associating, and Communicating (Badriyah et al., 2021).

Third the evaluation stage. The evaluation aims to determine the achievement of children's development after participating in STEAM learning at Talenta Kindergarten Semarang. Evaluation at Talenta Kindergarten is carried out every three or six months. Evaluation also aims to resolve obstacles that occur and find appropriate solutions. The principal and teachers attended the evaluation activity. The assessment used in Talenta Kindergarten is the same as the assessment in general, namely by observation, anecdotal notes, performance, and work results, which are then concluded into activity assessment sheets in the form of BB (Undeveloped), MB (Starting to Develop), BSH (Developing as Expected), and BSB (Developing Very Well). The principal of Talenta Kindergarten revealed that with STEAM learning, it is hoped that children will be able to solve problems, think creatively, and describe their imagination. In this regard, assessment techniques in Early Childhood Education are carried out through observation, anecdotal notes, conversations, assignments, performances, works, development of self-assessment tools, and standard instruments (Rofi'ah & Fatonah, 2021).

Conclusion

STEAM learning in Talenta Kindergarten has been implemented well by the stages of STEAM learning in early childhood. STEAM learning allows children to express their imagination, and they can create works according to their interests and desires. Talenta Kindergarten is an inclusive school that accepts all children without distinction, including children with special needs, so when implementing STEAM learning, I am doubtful because what is in the shadow of teachers of children with needs will find it difficult with STEAM learning. However, the fact is that the application of STEAM learning in Talenta Kindergarten is more accessible than previously imagined. However, children with special needs get much sensory nutrition with STEAM learning through playing with magic puffer balls and loose parts.

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