STEAM TRAINING FOR PRE-SCHOOL TEACHERS IN CIHANJAWAR VILLAGE, PURWAKARTA DISTRICT

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ABSTRAK

Pembelajaran STEAM (Sains, Technology, Engineering, Art, and Math) semakin penting di era digital ini. Kurangnya pengetahuan pada guru PAUD di Desa Cihanjawar Kabupaten Purwakarta dan penerapan pembelajaran STEAM membuat siswa kesulitan memahami penerapan praktisnya. Kreativitas dan inovasi juga kurang ditekankan, menyebabkan siswa terjebak dalam pola pembelajaran yang hanya menghafal. Diperlukan pendekatan holistik dan terintegrasi yang menggabungkan elemen-elemen STEAM, selain itu dapat mengembangkan keterampilan kritis, kreatif, dan kolaboratif siswa. Melalui pelatihan ini, diharapkan guru PAUD di Desa Cihanjawar dapat meningkatkan kemampuan dalam mengajarkan STEAM kepada siswa sebagai bekal dalam menerapkan pembelajaran STEAM di setiap lembaga masing-masing, sehingga diharapkan generasi mendatang dapat menghadapi tantangan masa depan dengan lebih siap dan mendorong inovasi berkelanjutan. Kegiatan pelatihan ini dilakukan dengan menggunakan metode presentasi dan pelatihan. Sebelum dilakukan pelatihan guru diberikan pemahaman tentang STEAM kemudian guru dibagi kedalam beberapa kelompok untuk mempraktekan beberapa kegiatan pembelajaran STEAM. Hasil dari pelatihan ini 90% pengetahuan dan keterampilan guru-guru PAUD di Desa Cihanjawar meningkat dalam mempraktekkan pembelajaran STEAM.

Kata kunci : (Pembelajaran STEAM, Pelatihan Guru, Pendidikan Anak Usia Dini)

ABSTRACT

STEAM learning (Science, Technology, Engineering, Art, and Math) is increasingly important in this digital era. The lack of knowledge of PAUD teachers in Cihanjawar Village, Purwakarta Regency and the application of STEAM learning makes it difficult for students to understand its practical application. Creativity and innovation are also less emphasized, causing students to be trapped in learning patterns that only memorize. A holistic and integrated approach that incorporates STEAM elements is needed, in addition to developing students' critical, creative and collaborative skills. Through this training, it is hoped that PAUD teachers in Cihanjawar Village can improve their ability to teach STEAM to students as a provision in implementing STEAM learning in each of their respective institutions, so that it is hoped that future generations can face future challenges more readily and encourage continuous innovation. This training activity was carried out using presentation and training methods. Before the training, teachers were given an understanding of STEAM and then teachers were divided into several groups to practice several STEAM learning activities. As a result of this training, 90% of the knowledge and skills of PAUD teachers in Cihanjawar Village increased in practicing STEAM learning.

Keywords : STEAM Learning, Teacher Training, Early Childhood Education

INTRODUCTION

In today's era of globalization and rapid technological development, education plays a crucial role in preparing the younger generation to face future challenges. As the dynamics of the world continue to evolve, the need for innovation and critical thinking skills is increasingly urgent. Early Childhood

Education (ECED) plays an important role as an early foundation in children's development, especially in shaping character, basic skills, and early knowledge that will become their foundation in living the next life (Sujiono, 2012). One of the educational approaches that is currently widely discussed and considered relevant to the needs of the times is the STEAM (Science, Technology, Engineering, Arts, and Mathematics) approach. The STEAM approach not only integrates the five disciplines, but also emphasizes interdisciplinary learning. This approach focuses on developing problem-solving, creativity, and critical thinking skills-competencies that are needed to face the challenges of the 21st century. The Merdeka curriculum launched by the Indonesian government is in line with STEAM learning. This curriculum emphasizes more flexible learning freedom and encourages optimal development of student potential. With the Merdeka Curriculum, teachers are given the freedom to develop lesson plans that are more contextual and relevant to student needs, including adopting an interdisciplinary STEAM approach.

Several studies have shown that STEAM-based learning (Science, Technology, Engineering, Arts, and Mathematics) has a positive impact on child development, training learners both cognitively, skills, and affective. The first study developed a STEAM learning model for PAUD in Rumbai Pesisir sub-district and showed an increase in teacher knowledge and understanding after testing this model (Wahyuni et al., 2020). Then the second study found that PAUD teachers in Bukit Harapan village, North Bengkulu Regency, did not understand and apply STEAM learning with loose parts games, and efforts to increase understanding were being pursued to explore children's creativity (Limbong et al., 2019). And finally the third research emphasizes the importance of STEAM-based 21st century learning planning, which integrates knowledge, skills, attitudes, and mastery of technology by emphasizing the 4Cs (Communication, Collaboration, Critical Thinking, Creativity). STEAM learning helps children analyze problems with various approaches, becoming an important strategy to maintain survival in the modern era (Alfirda Dewi Nugraheni, 2019). From some of the research results above, it can be concluded that STEAM-based learning has a significant positive impact on children's development, training them

in cognitive, skill and affective aspects. Research shows that the STEAM learning model in early childhood education improves teachers' knowledge and understanding, although it is still in its infancy.

Many PAUD teachers still have difficulties in implementing the STEAM approach in daily learning activities. Teachers' knowledge of the concept and application of STEAM is still very minimal, which results in the teaching methods used tend to be monotonous and not varied. This makes the learning process less interesting and less effective in stimulating children's interest. In addition, the challenges faced include the lack of resources and supportive learning tools, as well as the lack of opportunities to attend adequate training and guidance. These constraints cause the application of STEAM methods in the teaching and learning process in PAUD to be less than optimal, so that the full potential of this approach cannot be achieved. To overcome these obstacles, a comprehensive and sustainable training program is needed for PAUD teachers. This training program is expected to provide a deep understanding of STEAM learning concepts and methods, as well as provide various strategies and tools that can be used in learning activities. With adequate training, ECD teachers will be more prepared and confident in implementing the STEAM approach. They will be able to create an innovative, creative and fun learning environment for children, which in turn can stimulate children's interest and enthusiasm to explore various concepts of science, technology, engineering, art and technology.

In Indonesia, there are still many villages that are left behind in terms of access to adequate education, one of which is in Cihanjawar Village, Purwakarta Regency, therefore a holistic and collaborative approach between the government, educational institutions, non-governmental organizations, and the private sector needs to work together to improve access and quality of STEAM education in rural areas. These efforts can include improving educational infrastructure, intensive training for teachers, providing interactive and innovative learning resources, and programs that can generate student interest in STEAM. Through training in this community service activity, it is hoped that PAUD teachers in Cihanjawar Village, Purwakarta Regency can have equal opportunities to develop and contribute to the advancement of science and technology in Indonesia.

Equitable STEAM knowledge will be key in creating a society that is inclusive, productive, and ready to face global challenges in the future.

The methodology in this training activity is based on a service learning approach that emphasizes practical aspects and the concept of experiential learning, where knowledge is applied in direct interaction with the community and becomes a solution to the problems faced by them. This training is a form of community service, with three important criteria: meeting the needs and providing direct benefits to the community, improving the quality of academic learning, and involving active student participation in interacting with the community (Agus Afandi, Nabiela Laily, Noor Wahyudi, 2022). This activity was carried out through presentation and training methods, with participants consisting of various educational backgrounds, including teachers with non- bachelor Early Childhood Education, high school teachers, and Early Childhood Education students who are also high school teachers. Students and lecturers participated in this activity, as part of the implementation of the tri dharma of higher education.

The data collection technique in this activity uses focus group discussions, where all respondents are interviewed regarding their knowledge of STEAM learning. After that, they were given practical training starting from explaining the material about STEAM to the techniques to be practiced, and asked to solve problems in STEAM learning (Fitrah, 2017). The model applied is the Experiential Learning Model, which consists of four stages: real experience, reflective observation, conceptualization, and implementation. The initial stage involved a needs analysis by interviewing early childhood teachers about STEAM learning, which was then reflected upon individually. Next, the researcher sought the underlying needs of the experience through interviews and on-site observations of early childhood education institutions in Cihanjawar Village. The second stage is reflection, becoming the basis for analyzing the underlying needs of the previous experience. The third stage, conceptualization, involves creating a concept of training activities that fit the needs. The last stage, implementation, includes two stages of activities, namely presentations and discussions on the importance of teachers having knowledge and skills in STEAM learning for

teaching and learning activities in PAUD institutions. It aims to enable participants to develop a more open mindset in school teaching.

In the first stage of the activity, participants are guided through the presentation of material that includes the definition of STEAM, the relevance of STEAM learning in early childhood, and STEAM learning approaches in Early Childhood Education Institutions. This stage also includes a discussion or question and answer session to clarify understanding. Afterwards, participants were briefed on some techniques in STEAM learning, giving them the opportunity to express their views on this topic. In the second stage, participants were divided into three groups for hands-on STEAM learning. They were asked to choose a storybook and find solutions through the STEAM approach by solving the problems contained in the storybook. Participants were given about one hour to complete this task by applying the STEAM techniques they had learned. Afterward, participants were asked to give their impressions and messages during the training. This activity took place in Cihanjawar Village, which is a community service location for research universities.

DISCUSSION

This training activity adopted four important stages: 1) Concrete Experience Stage, 2) Observation-Reflection Stage, 3) Conceptualization Stage, and 4) Implementation Stage. The location for the implementation of this activity was chosen in Cihanjawar Village because it became a fostered village for STAI DR KH EZ Muttaqien Purwakarta in carrying out the tri dharma of higher education, especially in community service. Participants involved in this training include school principals, teachers with a non-Early Childhood Education S1 educational background, teachers with a high school educational background, and teachers with a high school educational background who are also Early Childhood Education students.

The first stage, Concrete Experience, began with a series of interviews. The results of the interviews showed that one of the main complaints from early childhood education teachers in Cihanjawar Village was the lack of knowledge about STEAM learning and the lack of training provided for them. This resulted

in a lack of skills in applying STEAM learning. In addition, there are still many teachers who have not pursued higher education, so they need guidance and training in STEAM learning.

The second stage in this process is reflection observation, which involves debriefing about STEAM learning in PAUD institutions in Cihanjawar Village. The problems identified include the lack of teacher knowledge about STEAM learning, the low level of teacher education, the absence of training on STEAM learning, and the lack of innovation in utilizing learning tools and materials. These factors hinder the improvement of teacher quality in STEAM learning, making the learning process for early childhood monotonous and boring. Observations show that teachers rarely do problem-solving-based learning through STEAM practices, many tools and materials at school are not utilized, and learning methods are still dominated by the use of books and magazines. In addition, teachers tend not to utilize materials and media from the surrounding environment, and the methods used are less varied. During the training, it was found that many teachers do not understand STEAM learning techniques, have difficulty understanding electronic techniques, and low knowledge makes learning media less innovative. Many teachers are also still confused in STEAM learning practices and have not realized that storybooks can improve children's critical thinking skills. Therefore, support is needed from the government, universities and other organizations to conduct training that can develop teachers' ability to innovate and improve STEAM learning in PAUD institutions, in order to create a more enjoyable learning process for children.

The third stage is conceptualization, where teachers are given an understanding of the concept of STEAM learning and the importance of utilizing tools and materials available at school. Participants learn about what STEAM is, its approach, supporting methods, teaching techniques, and tools and materials to teach critical thinking in children. It is emphasized why teachers should be familiar with STEAM and how this learning can develop all aspects of child development. In the face-to-face training, participants receive not only theory but also hands-on practice. However, obstacles found through interviews and observations show that many teachers still do not know what STEAM is and how

to teach it. Teachers tend to only give assignments from worksheets or magazines without interesting learning media innovations, so the learning process is not child-centered.

The fourth stage is the implementation stage, which requires attention to several key points in the training to suit the needs of the participants. First, the information presented should cover real situations in the field, not just theory, to make it easier for participants to accept. Second, the training location should support the smooth running of the event. Third, the material should be presented in an interesting way to prevent boredom. Fourth, the language used should be simple and easy to understand. Fifth, training activities need to be interspersed with singing to motivate teachers to innovate. Sixth, it is important to foster motivation so that teachers continue to innovate in STEAM learning. Seventh, participants should be given the opportunity to practice STEAM learning techniques. Finally, the training should be conducted offline so that the theory provided can be directly practiced by teachers, ensuring more effective understanding and skills.

During the training, participants went through several stages: forming groups, choosing tools and materials provided to encourage creativity, reading storybooks, providing solutions based on the stories, creating STEAM techniques to produce these solutions, designing STEAM learning techniques, presenting the design results, explaining the reasons behind the techniques created, and playing the design results. In the implementation, many participants were initially confused with STEAM techniques, especially electronic techniques, such as making lights turn on. However, after a few tries, participants began to understand the techniques and were satisfied with the results achieved. By the second attempt, participants were able to practice the electronic techniques without assistance, demonstrating improved skills. After the training, participants gave positive feedback, stating that this training should be held again, they enjoyed the activity, their knowledge and skills improved, innovation in STEAM learning increased, and they were better able to utilize available tools and materials.

The implementation of the training activities went according to plan, was conducive and fun. Participants' enthusiasm and consistency from start to finish

were excellent. The participants' understanding of the STEAM learning technique design innovation was seen when each individual succeeded in producing a problem solution from storybooks, something that had never been thought of before. They are able to practice STEAM learning by utilizing storybooks to develop all aspects of child development. This shows that the training materials are well received and the motivation of the participants is very high. However, further activities are needed to continue to encourage learning innovation, so that participants have the motivation to continue to improve the quality of learning in Early Childhood Education Institutions in Cihanjawar Village, Bojong District, Purwakarta Regency.

CONCLUSION

The results of the training show that the improvement of knowledge and skills in STEAM learning for early childhood is effectively implemented. The training consists of four stages: concrete experience, reflection observation, conceptualization and implementation. The training successfully increased participants' knowledge and creativity, enabling them to explore and design STEAM learning techniques that can be implemented in their respective institutions. In addition, participants can gain insight into the utilization of tools and materials for STEAM learning. Although there are limitations, such as participants' understanding of STEAM techniques that need to be improved, this training runs effectively and efficiently. This activity was attended by all PAUD teachers in Cihanjawar Village, Bojong District, Purwakarta Regency, which is the fostered village of STAI DR KH EZ Muttaqien Purwakarta in carrying out the tri dharma of higher education, especially community service.

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