International Journal of Multicultural and Multireligious Understanding

http://ijmmu.com
editor@ijmmu.com
ISSN 2364-5369
Volume 10, Issue 6
June, 2023
Pages: 83-92

Increasing the Creativity of Early Childhood Education (Paud) Educators Through Steam and Loose Part Learning Training in Malang City

Rezka Arina Rahma; Sucipto; Kukuh Miroso Raharjo

Department of Non-Formal Education, Faculty of Education, Universitas Negeri Malang, Indonesia

http://dx.doi.org/10.18415/ijmmu.v10i6.4845

Abstract

Early Childhood Education (PAUD) is an educational service aimed at children between the ages of 0-6 years. STEAM learning encourages young children to explore their abilities in a personalized manner. This approach also promotes collaborative work, which enhances children's development. Learning during early childhood can be facilitated through loose part-based STEAM learning, which combines play and educational elements. The implementation of loose parts carefully considers objects and environments that foster learning connections and stimulate creative thinking. This community service activity adopts a sharing and caring approach, employing various methods such as training, workshops, discussions, on-the-job training, consultation, and evaluation. Overall, the service activity resulted in an improved understanding among the participants after receiving the training. The implementation of activities led to several outcomes, including: (a) increased creativity of educators, assessed through portfolios; (b) enhanced knowledge of STEAM learning among educators; (c) understanding of the Loose Part method, measured through performance; and (d) improved ability of educators to explore children's potential and create diverse play experiences.

Keywords: *Increased Creativity; Educators; Early Childhood Education (PAUD); STEAM; Loose Part*

Introduction

Currently, Indonesia is facing a rapid global challenge, leading to the replacement of human resources with technology. In such circumstances, the role of education becomes increasingly important, particularly in enhancing skills. Frydenberg & Andone (2011) emphasize the significance of life skills in equipping students with the ability to seek knowledge, innovate using technology and information media, and thrive in the present era. The field of education must continuously evolve and adapt to the rapid technological advancements witnessed in today's world.

At the Early Childhood Education (PAUD) level, a well-defined curriculum is crucial for guiding the implementation of learning and improving the quality of education. As stated in Law Number 20/2003 regarding the National Education System, a curriculum encompasses various agendas and regulations concerning learning content and the implementation of training to fulfill the educational objectives.

In Indonesia, the current educational framework follows the 2013 Curriculum, which extends to the PAUD level. The 2013 PAUD curriculum adopts a scientific approach, incorporating observation, inquiry, exploration, association, and communication. Learning activities take place not only in the classroom but also in the school environment, nature, and the surrounding community.

In order to fulfill the objectives outlined in the RI Law No. 20/2003, which pertains to the National Education System, it is crucial to invest in human resources across all lines, types, and levels of education from an early age. Early childhood education plays a vital role in preparing individuals for further education. By providing progressive and continuous training stimuli, children from birth to the age of six can be equipped with the necessary skills to pursue higher education.

Therefore, early age learning holds immense significance as it encompasses the golden age of 0-6 years. This period is crucial for maximizing children's progress and growth, as it coincides with rapid brain development. Additionally, during this stage, children are highly receptive to learning, imitating what they observe, and exhibiting a strong curiosity.

In PAUD, teachers play a crucial role in children's education from an early age, alongside the responsibilities of parents. The role of an early childhood teacher extends beyond the mere transmission of knowledge, as they recognize that knowledge cannot be transferred without the active participation of the child. In order to enhance the quality of education and achieve successful learning outcomes in the 21st century, it is essential for students to develop creative abilities, critical thinking skills, effective communication, and collaborative capabilities. Therefore, several supports are necessary, including adequate facilities and well-trained teachers.

Teachers, as experts in their respective fields, have multiple responsibilities such as educating, imparting knowledge, guiding, training, assessing, and evaluating students. They play a critical role in supporting students' learning achievements, assuming the role of secondary educators after parents, providing guidance on a daily basis. To effectively compete in the present-day education landscape, teachers are expected to possess critical thinking skills, collaborate effectively, communicate proficiently, foster a creative mindset, and demonstrate an understanding of science and technology advancements.

PAUD in Indonesia is experiencing growth, supported by various innovative learning methods and tools that cater to the diverse needs of children. Currently, PAUD focuses on deepening learning experiences to nurture children's creativity, innovation, and scientific skills, tailored to their developmental stages.

PAUD aims to prepare students who are competitive and capable of thriving in a broad spectrum of challenges. These preparations are complemented by the development of technology and innovative learning approaches. STEAM (Science, Technology, Engineering, Art, and Mathematics) learning, as highlighted by Saddhono, Sueca, Sentana, Santosa, & Rachman (2020), aims to cultivate children's analytical skills in addressing real-world problems, employing various approaches to equip students with the necessary skills to compete and succeed.

STEAM learning promotes early childhood development by allowing them to explore their abilities in their own unique ways. It also fosters group work, which enhances children's socio-emotional, physical, motor, and cognitive skills (Nopiyanti, Adjie, & Putri, 2020). Furthermore, STEAM learning instills a sense of responsibility in early childhood, both individually and in groups, thereby nurturing their noble character. Loose Part-based learning is a method within STEAM that involves creating various works using recycled materials, both individually and in groups (Qomariyah & Qalbi, 2021).

Early childhood learning often incorporates play-based activities that do not necessarily require expensive toys. The concept of learning while playing can be applied through Loose Part-based STEAM learning in early childhood. In the implementation of Loose Part, careful consideration is given to the

selection of objects and environments that facilitate learning connections and foster creative thinking. This approach empowers children's creativity and improves their critical thinking abilities, problem-solving skills, and scientific foundation (Nopiyanti et al., 2020).

PAUD educators in Playgroups and Child Care Parks in Malang City face challenges related to the lack of creativity in designing learning activities. Additionally, the current learning approach tends to be centered around educators, with all learning information originating from them. However, in today's era of rapid technological development, learning should be student-centered, allowing early childhood learners to explore their full potential. Failing to maximize the exploration of early childhood potential during their golden age of growth and development would be unfortunate, as this period is crucial for sharpening their abilities and broadening their knowledge in order to unleash their potential at the next educational level.

Implementing a student-centered learning approach in early childhood requires significant effort and collaboration, along with well-integrated learning tools and supports such as curriculum, learning media, and materials. Based on the identification results with partner institutions, it was agreed to conduct community service activities in the form of training and mentoring to enhance the creativity of PAUD educators in implementing Loose Part-based STEAM learning for early childhood.

Given the above explanation, there is a need for a solution to enhance the creativity of non-formal PAUD educators. The community service team addresses this through training on Loose Part-based STEAM learning. Educators are encouraged to explore new learning innovations and practice effective learning procedures, enabling the maximum application of the Loose Part-based STEAM method.

Method

The community service program was implemented using a sharing and caring approach, delivered through e-learning. The sharing and caring approach fostered an informal environment for exchanging information and providing constructive input. The specific methods employed for problem-solving are described as follows:

1. Education and Training Method: This method involved delivering relevant training materials to enhance the creativity of non-formal PAUD educators in implementing Loose Part-based STEAM learning. The training covered the following topics: (a) the concept of STEAM learning, (b) application of the Loose Part method, (c) exploring the potential of early childhood, and (d) assessing play experiences.
2. Discussion Method: Training activities included interactive discussions to share perspectives on addressing problems and provide constructive input. This method encouraged interaction between resource persons and participants, as well as among participants themselves.
3. On-the-Job Training Method: This method involved a comprehensive review of the implementation of Loose Part-based STEAM learning in PAUD settings before and after the training. It aimed to enhance the ability of PAUD educators in Malang City to design creative Loose Part-based STEAM learning experiences that offer diverse learning opportunities. Practical learning activities were conducted, and the outcomes were documented through video recordings.
4. Consultation Method: This method facilitated communication to address any challenges encountered during the implementation of Loose Part-based STEAM learning. It aimed to provide insights and recommendations to optimize the learning process.

The partner institutions' involvement in the program implementation included providing locations and participants as human resources. Additionally, each partner contributed a Loose Part-based STEAM Learning Program Plan (RPP) as a learning tool, which served as input for consultation to ensure desired outcomes.

The community service program underwent evaluation following its completion to assess its effectiveness. Evaluation activities included pre-test and post-test assessments to measure changes resulting from the community service activities.

Upon evaluating the program's implementation, the program proposer and the team provided ongoing assistance through consulting services to partner institutions facing challenges. This support aimed to sustain and further develop the community service program, enhancing the quality of early childhood education in Loose Part-based STEAM learning.

Results and Discussion

Early childhood, defined as the age group of 0-6 years, is a critical period characterized by extraordinary brain and physical development. This golden age of childhood should not be overlooked, as the stimulations received during this time greatly contribute to future development and survival. It is imperative to provide quality education during early childhood to effectively nurture and stimulate various aspects of children's development, including cognitive, language, physical-motor, socio-emotional, religious and moral values, and artistic abilities (Imamah & Muqowim, 2020).

However, the implementation of early childhood education often faces challenges, such as a lack of creativity and innovation among teachers and inadequate educational game tools (APE) that hinder the development of children's creative and critical thinking abilities. According to Government Regulation No.19/2005 concerning National Education Standards, the learning process in academic units should be interactive, inspiring, enjoyable, challenging, and motivating for students (Wulandari, Mulyana, & Lidinillah, 2020).

One alternative method of learning that can restore the natural learning process of children is the STEAM-based (Science, Technology, Engineering, Arts, and Mathematics) learning method. STEAM-based learning has the potential to enhance the quality of education, particularly in early childhood education (Wulandari, Mulyana, & Lidinillah, 2020).

One specific learning media used in STEAM learning for early childhood is Loose Parts. Loose Parts are materials that can be separated, recombined, carried, combined, moved, and used individually or in combination with other natural or synthetic objects. Loose Parts are suitable for STEAM learning because they align with children's characteristics, allow for adaptation and manipulation in various ways, foster creativity and imagination, and encourage the development of children's ideas. Loose Parts also facilitate children's risk-taking, exploration, investigation, active involvement, sensory experiences, collaboration, and dramatic play (Najamuddin, Fitriani, & Puspandini, 2022).

Loose Parts refer to a collection of natural or artificial objects that can stimulate children's imaginative play. These objects provide open-ended support for children's development and work. Engaging with Loose Parts encourages children to observe and investigate the objects they use, fostering diverse and unique thinking patterns. The absence of strict rules in using Loose Parts allows for endless possibilities and exploration by children. The materials available can stimulate children's development and help them recognize their thinking potential. Children are free to determine how they will use the objects and which objects they choose to play with (Kiewra & Veselack, 2016).

At the Early Childhood Education (PAUD) level, the 2013 Curriculum is implemented. The integrative thematic and scientific approaches of the 2013 PAUD curriculum are highly suitable for integrating STEAM and Loose Part-based learning. This curriculum employs various contexts that relate the subject matter to real-life situations, using everyday themes or topics familiar to children. This approach is built upon a scientific approach that involves observing, questioning, exploring, making

connections, and communicating. As a result, teaching and learning activities can take place both inside and outside the classroom, including the school environment, nature, and the child's surroundings.

STEAM, as explained by Kang (2019), encompasses science, technology, engineering, and mathematics-based learning, focusing on problem-solving in the real world. The STEAM learning model encourages children to develop curiosity and an open-mindedness towards new experiences. It emphasizes the process of creating, where the manufacturing process holds greater significance than the final product. Within this process, various aspects such as exploration, creative thinking, engineering design, creative expression, evaluation, and redesign are integrated. Through STEAM, children learn to observe, play, explore patterns, and practice creative thinking, collaboration, and communication skills while completing tasks or projects assigned by their teachers. Additionally, this process encourages children to think creatively and critically about the knowledge they have acquired, leading them to solve problems collaboratively with their peers (Guyotte, Sochacka, Costantino, Walther, & Kellam, 2014).

Implementing STEAM in education involves incorporating concepts from science, technology, engineering, and mathematics. Technological applications in STEAM education include the use of tools such as PowerPoint, blackboards, and assessment programs with digital, web, DVD, video, or other multimedia elements. At the PAUD level, teachers can introduce STEAM concepts through discussions while children engage in drawing activities. Teachers can also provide experiences for children through sound, movement, and verbal language, and by inviting children to explore scientific concepts. The development of STEAM education goes beyond the mastery of scientific, technological, engineering, and mathematical content; it also focuses on fostering critical thinking skills to creatively solve problems. The forms of creativity encouraged include fluency, flexibility, originality, and elaboration. Furthermore, STEAM education can foster children's independence. However, it is crucial for teachers to have a deep understanding of STEAM to ensure its appropriate implementation (Nurjanah, 2020).

Implementing STEAM requires professional teachers who possess characteristics such as creativity, innovation, and critical thinking. These qualities enable teachers to interpret the STEAM concept effectively at their educational level. The STEAM approach expects students to develop problem-solving skills, innovation, confidence, and logical thinking. However, some teachers who lack a thorough understanding of STEAM still perceive the elements of Science, Technology, Engineering, Art, and Mathematics as separate and unrelated. The understanding of teachers plays a vital role in the successful implementation of STEAM, and a lack of comprehension can be seen as a drawback (Suganda et al., 2021).

In the context of non-formal Early Childhood Education (PAUD) in Malang City, Playgroups and Child Care Parks face challenges related to the limited creativity of educators in designing learning activities. Additionally, educators are often unfamiliar with STEAM learning, particularly in the form of Loose Parts, and struggle to implement it effectively for early childhood education. The lack of knowledge among PAUD educators about STEAM learning with Loose Parts becomes an obstacle to supporting effective learning practices. Consequently, the learning process remains centered around the educator, with all learning information being transmitted from the teacher to the students. However, in the current era of rapid technological development, learning should be student-centered, allowing them to explore their full potential. The failure to fully explore the potential of early childhood is unfortunate, as this crucial developmental stage offers children the opportunity to hone their abilities and broaden their knowledge for future educational levels.

To address these challenges, efforts were made to enhance the creativity of PAUD educators through STEAM and Loose Part learning training in Malang City. The training covered three main areas: STEAM-based learning, the utilization of Loose Parts as learning media, and the preparation of STEAM-based learning tools using Loose Parts.

At the initial stage (Session I) of the training, PAUD educators were provided with insights into learning trends and the focus on STEAM-based learning, specifically for early childhood education. In the subsequent stage (Session II), participants received information about learning media, including its meaning, function, how to select appropriate learning media, and an introduction to Loose Parts as one of the learning media options. PAUD educators gained understanding about the meaning, types, and application of Loose Parts in learning.

Moving on to the next stage (Session III), the participants were guided in creating STEAM learning tools using Loose Parts. The process of making learning tools was explored across various themes. Following the creation of these tools, PAUD educators had the opportunity to practice microteaching using the tools they had made.

Lastly, the committee conducted an evaluation to assess the level of success achieved through the program activities. The evaluation aimed to measure the effectiveness of the community service program's implementation. It involved comparing participants' knowledge before the training with their knowledge after engaging in the community service activities.

Below are some photos showcasing the implementation of the STEAM and Loose Part learning training for educators.

Figure 1. Presentation of the material by the speaker

Figure 2. Discussion activities with training participants

Figure 3. Documentation with speaker and training participants

From the implementation of these community service activities, several achievements were attained. PAUD educators demonstrated an improved understanding of STEAM learning, gained familiarity with the Loose Part method, showcased enhanced abilities to foster children's creativity, and successfully created diverse and enriching play experiences. The overall success of these achievements is supported by the results of the pre-test and post-test assessments.

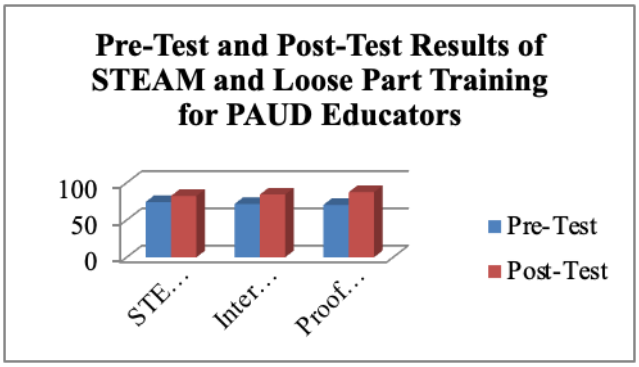

Figure 4. Pre-Test and Post-Test Results of STEAM and Loose Part Training

Based on Fig. 4 above, it is evident that there was an overall improvement in the understanding of PAUD educators as participants after receiving training from the community service activities. This enhanced understanding encompasses various aspects, including the concept of STEAM and Loose Part. Specifically, there was an increase of 8.14 in the average pre-test score, which initially stood at 74.25.

Another aspect that saw improvement was the understanding of STEAM examples and their interpretation through Loose Part within the K-13 PAUD curriculum. The average pre-test score increased by 12.75, reaching 71.51.

Furthermore, the aspect related to the application of evidence in daily life also experienced a notable increase, with the average pre-test score of 70.25 rising to 87.3 during the post-test. These aspects serve as indicators for the assessment conducted by the community service team.

Moreover, PAUD educators were able to explain each element of STEAM, namely science, technology, engineering, art, and mathematics. Participants demonstrated their understanding of science as the development of children's scientific abilities, involving activities such as observation, questioning, data collection, analysis, and communication, in line with Putri (2019) argument that science learning for early childhood can be initiated through stimulating questions. Another statement reinforces that science

for early childhood is defined as a variety of things that stimulate children to build curiosity, interest, and problem solving, thus giving rise to thoughts and activities to observe, think, and relationships between concepts (Hasanah, Hikmayani, & Nurjanah, 2021).

Regarding the element of technology, educators interpret it using devices/gadgets such as cellphones, laptops, and LCDs. However, learning can be carried out properly using simple technology such as household appliances, play equipment, and others. Henriksen (2017) argues for distinguishing technology into two types: simple and modern. Examples of simple technology for early childhood include pencils, crayons, scissors, rulers, and equipment that is part of children's games. Meanwhile, modern technology emphasizes the use of modern equipment in children's learning, such as laptops, PCs, gadgets, and platforms like Zoom, YouTube, WhatsApp, Google Classroom, and others.

Educators also understand that the engineering element of STEAM does not require the preparation of machines related to automotive or electricity for learning. Engineering is defined as a teacher preparing children to solve problems. Introducing children to materials or objects, designing, assembling, or building around their daily lives serves as examples for children to become problem solvers. The engineering element, as stated by Pramudyani & Indratno (2022), involves children engaging in engineering technology through problem identification and problem-solving activities. These activities can include children playing with blocks, using scissors, spoons, bottle openers, or constructing buildings.

Regarding the art element, educators understand that creative and active thinking is at the core of STEAM. Art can be interpreted as children creating products that have aesthetic value. Art activities in STEAM are not limited to coloring, cutting, pasting, and drawing but also include crafts, visual arts, and audio arts. Similarly, for the last element, mathematics, PAUD educators understand that it encompasses more than just calculations such as addition, subtraction, multiplication, or division. It can also introduce concepts of size, shape, volume, distance, and other mathematical concepts used by students in their daily lives.

From this broad scope, it can be understood that the STEAM learning concept consists of the elements of science, technology, engineering, art, and mathematics. Its implementation can be developed with other concepts, one of which is through Loose Parts. This demonstrates that STEAM is an approach that can be applied at all levels of education, including PAUD. The concept of STEAM learning can be facilitated by providing simple experiences for children. Loose Parts is a concept that involves using learning materials that can be found in the child's environment, serving as a connection between the child and the surrounding environment (Wahyuningsih et al., 2020).

Conclusion

In conclusion, the community service program has demonstrated overall success, as indicated by the increased understanding of PAUD educators who participated in the training, as measured through pre-test and post-test results. The increased understanding encompasses various aspects, including the concept of STEAM and Loose Part. The average pre-test score for the concept of STEAM and Loose Part was 74.25, which showed an improvement of 8.14 points in the post-test. Similarly, there was a significant increase in understanding STEAM examples and their application in the K-13 PAUD curriculum, with the average pre-test score of 71.51 rising by 12.75 points in the post-test. Moreover, evidence of practical application in daily life also exhibited improvement, with the average pre-test score of 70.25 rising to 87.3 in the post-test. These aspects serve as indicators for the assessment conducted by the community service team. Additionally, PAUD educators have gained a comprehensive understanding of the elements of STEAM, namely science, technology, engineering, art, and mathematics.

The community service implementing team offers suggestions and recommendations for the PAUD educators in Malang City to consistently implement the mentoring and training outcomes. It is

crucial to enhance the educators' creativity in designing learning experiences by applying STEAM learning through Loose Part activities. By shifting the focus from solely relying on educators for learning information to empowering students to explore their potential, educators can provide a more comprehensive learning environment. The exploration of early childhood potential is vital during the golden age, as it enables children to develop their abilities and knowledge extensively, preparing them for the next stages of education.

Acknowledgement

We would like to express our gratitude to Universitas Negeri Malang (UM) for providing us with the opportunity to conduct this community service program. We are also thankful to the PAUD educators in Malang City, East Java, who have been our partners and have shown great willingness to collaborate throughout this endeavor. Additionally, we extend our appreciation to all the individuals and organizations who have contributed to the successful implementation of this community service activity.

References

Frydenberg, M., & Andone, D. (2011). Learning for 21st century skills. *International Conference on Information Society (i-Society 2011)*, 314–318. London: IEEE. https://doi.org/10.1109/i-Society18435.2011.5978460.

Guyotte, K. W., Sochacka, N. W., Costantino, T. E., Walther, J., & Kellam, N. N. (2014). Steam as Social Practice: Cultivating Creativity in Transdisciplinary Spaces. *Art Education*, *67*(6), 12–19. https://doi.org/10.1080/00043125.2014.11519293.

Hasanah, A., Hikmayani, A. S., & Nurjanah, N. (2021). Penerapan Pendekatan Steam Dalam Meningkatkan Kreativitas Anak Usia Dini. *Jurnal Golden Age*, *5*(2), 275–281. https://doi.org/10.29408/goldenage.v5i2.3561.

Henriksen, D. (2017). Creating STEAM with Design Thinking: Beyond STEM and Arts Integration. *The STEAM Journal*, *3*(1), 13.

Imamah, Z., & Muqowim, M. (2020). Pengembangan kreativitas dan berpikir kritis pada anak usia dini melalui metode pembelajaran berbasis STEAM and loose part. *Yinyang: Jurnal Studi Islam Gender Dan Anak*, 263–278. https://doi.org/10.24090/yinyang.v15i2.3917.

Kang, N.-H. (2019). A review of the effect of integrated STEM or STEAM (science, technology, engineering, arts, and mathematics) education in South Korea. *Asia-Pacific Science Education*, *5*(1), 6. https://doi.org/10.1186/s41029-019-0034-y.

Kiewra, C., & Veselack, E. (2016). Playing with nature: Supporting preschoolers' creativity in natural outdoor classrooms. *The International Journal of Early Childhood Environmental Education*, *4*(1).

Najamuddin, N., Fitriani, R., & Puspandini, M. (2022). Pengembangan Bahan Ajar Science, Technology, Engineering, Art and Mathematics (STEAM) Berbasis Loose Part untuk Meningkatkan Kemampuan Pemecahan Masalah Anak Usia Dini. *Jurnal Basicedu*, *6*(1), 954–964. https://doi.org/10.31004/basicedu.v6i1.2097.

Nopiyanti, I., Adjie, N., & Putri, S. U. (2020). STEAM-PBL in Early Childhood Education: Optimization Strategies for Developing Communication Skills: *Proceedings of the 1st International Conference on Early Childhood Care Education and Parenting (ICECCEP 2019)*. Presented at the 1st International

Conference on Early Childhood Care Education and Parenting (ICECCEP 2019), Bandung, West Java, Indonesia. https://doi.org/10.2991/assehr.k.201205.090.

Nurjanah, N. E. (2020). Pembelajaran STEM berbasis Loose Parts untuk Meningkatkan Kreativitas Anak Usia Dini. *JURNAL AUDI: Jurnal Ilmiah Kajian Ilmu Anak dan Media Informasi PAUD*, *5*(1), 19–31. https://doi.org/10.33061/jai.v5i1.3672.

Pramudyani, A. V. R., & Indratno, T. K. (2022). Pemahaman Science, Technology, Engineering, Art dan Mathematic (STEAM) pada Calon Guru PAUD. *Jurnal Obsesi : Jurnal Pendidikan Anak Usia Dini*, *6*(5), 4077–4088. https://doi.org/10.31004/obsesi.v6i5.2261.

Putri, S. U. (2019). *Pembelajaran Sains untuk Anak Usia Dini*. Bandung: UPI Sumedang Press.

Qomariyah, N., & Qalbi, Z. (2021). Pemahaman Guru PAUD Tentang Pembelajaran Berbasis STEAM dengan Penggunaan Media Loose Parts di Desa Bukit Harapan. *JECED: Journal of Early Childhood Education and Development*, *3*(1), 47–52. https://doi.org/10.15642/jeced.v3i1.995.

Saddhono, K., Sueca, I. N., Sentana, G. D. D., Santosa, W. H., & Rachman, R. S. (2020). The application of STEAM (Science, Technology, Engineering, Arts, and Mathematics)-based Learning in Elementary School Surakarta District. *Journal of Physics: Conference Series*, *1573*(1), 012003. https://doi.org/10.1088/1742-6596/1573/1/012003.

Suganda, E., Latifah, S., Irwandani, Sari, P. M., Rahmayanti, H., Ichsan, I. Z., & Rahman, M. M. (2021). STEAM and Environment on students' creative-thinking skills: A meta-analysis study. *Journal of Physics: Conference Series*, *1796*(1), 012101. https://doi.org/10.1088/1742-6596/1796/1/012101.

Wahyuningsih, S., Pudyaningtyas, A. R., Nurjanah, N. E., Dewi, N. K., Hafidah, R., Syamsuddin, M. M., & Sholeha, V. (2020). The Utilization of Loose Parts Media in Steam Learning for Early Childhood. *Early Childhood Education and Development Journal*, *2*(2), 1. https://doi.org/10.20961/ecedj.v2i2.46326.

Wulandari, N. T., Mulyana, E. H., & Lidinillah, D. A. M. (2020). Analisis Unsur Art Pada Pembelajaran Steam Untuk Anak Usia Dini. *JPG: Jurnal Pendidikan Guru*, *1*(3), 135. https://doi.org/10.32832/jpg.v1i3.3284.

Copyrights