Learning Videos as Support Media Before Playing Children on STEAM Learning Contents at PAUD Nurul Hidayah

Mufarihah[1]([✉]), Fatihatus Saadah[1], Abdul Syukur[1], Faza Muhammad Noor[2], and Elnawati[3]

[1] Postgraduate of Educational Technology, Ibnu Khaldun University, Bogor, Indonesia
ihamufariha334@gmail.com
[2] Islamic Studies Program of the Postgraduate School, UIN Syarif Hidayatullah Jakarta, Jakarta, Indonesia
[3] Muhammadiyah Sukabumi University, Sukabumi, Indonesia

Abstract. The rapid advancement of technology in the 21st century brings major changes to all aspects of human life. The world of education must design learning devices and align them with technology to prepare their students to live in the 21st-century era. Learning models in Early Childhood Education must be the basis for the application of 21st-century children's skills. Through STEAM (Science, Technology, Engineering, Art and Mathematics) learning) Children have skills that can be done to prepare children to compete in facing life in the 21st-century era. STEAM is a learning content that combines scientific thinking through learning using loose parts learning materials and media to stimulate creativity, problem-solving, and high-order thinking in children. This paper contains a background in the form of challenges for early childhood to enter the era of 21st-century life as a reference for providing STEAM-based learning at Nurul Hidayah PAUD. Show learning videos as reinforcing children's knowledge on support activities before playing. Loose parts as tools and materials for children's play activities with Project Base Learning on children's learning processes. Using qualitative research methods, data collection through observation, interviews and documentation. The results of this study describe: 1) video learning service in STEAM class, 2) STEAM process in learning.

Keywords: STEAM · Learning Videos · Loose Parts · 21st Century Generation · PAUD

1 Introduction

According to Ali Bin Abi Tholib RA "Educate your children according to their time". The early childhood generation of millennials is expected to be creative, innovative, and ready to live in the 21st-century era. Education is one way to prepare children to live in their time through the learning process, by choosing child-centered learning methods.

Early childhood education, which still uses the old results-based method, only makes children passive, not creative, their reasoning power is not honed for exploration and

become imitators of their teachers. For this reason, teachers must be able to change the way children teach and learn with breakthrough methods and new approaches. One method in accordance with the demands of its time is the learning method with STEAM (Science Technology Engineering Art and Math) content. The application of STEAM content during learning provides opportunities for early childhood to think at higher levels in problem-solving. Children will get meaningful learning experiences through tools, materials for play, and their environment.

STEAM content is beneficial for early childhood because it can stimulate creativity and scientific imagination through direct observation, children gain knowledge directly through their play experiences, making children creative and innovative. The purpose of implementing STEAM content in early childhood learning is to produce interesting and fun learning by developing children's reasoning through play and learning activities. Educators as facilitators, providers of tools and materials for children's play, to develop.

Children's creativity and exploration to fulfill their curiosity. The addition of learning video shows according to the topics discussed during support activities before playing will further strengthen and explore children's potential in generating ideas and works. Early childhood education plays a role in developing all children's potential, inculcating diversity values and character education, developing basic knowledge and skills, developing motivation, and positive learning attitudes (Sujiono, 2013: 83). Educators with qualified and professional human resources in the implementation of the learning process, educators must be able to collaborate with children, through interesting and fun methods according to the child's age developmental stages.

The development of learning methods and approaches that are suitable for the present and future era of children's lives is very interesting to discuss, one of which is the application of the STEAM approach (science, technology, engineering, art, mathematic). Methods in learning can develop naturalist early childhood reasoning, where children will observe, ask questions, collect information and communicate.

Through STEAM-filled learning (science, technology, engineering, art, mathematic), children learn through playing with meaningful games using loose parts as tools and materials to play with. Educators provide rules in learning activities by giving them the freedom to choose various learning activities so that children will enjoy learning very happily and enthusiastically.

2   Method

Load STEAM with Learning Videos at support time before playing, STEAM is a learning content that can stimulate children to be more creative in problem solving, logical thinking and symbolic thinking. STEAM (Science Technology Engineering Art and Mathematics) in the learning process is packaged by combining science, technology, engineering, mathematics, and art. Children are stimulated to think critically in the learning process.

The addition of broadcast material in the form of learning videos related to the topic of discussion during support before playing strengthens children in core activities. Children gain new knowledge related to topics of discussion and become the inspiration for children when children communicate and work on core activities.

According to Morisson (2012: 24) Technology (Technology) helps empower children with the right technological abilities that will enhance, advance, and enrich learning and increase teacher, student, and parent collaboration.

According to Kemp & Dayton, learning media functions to motivate children's interests and actions, provide information and instructions in accordance with the learning theme. (Azhar Arsyad.) Learning media helps make it easier for children and teachers to learn, present real experiences, attract children's attention and interest in learning, and can also correlate theory with reality (Aminah. S. 2019). Sanaky said (2011: 5) the benefits of learning media as a tool in the learning process can provide interesting learning, foster learning motivation, the material presented is clearer and children don't get bored easily when absorbing learning material so that it can further improve children's learning outcomes.

STEAM's learning content integrates five disciplines into one cohesive way of learning processes that emphasize processes and solutions. Children are directed to find, explore, and solve problems. This approach allows students to explore mathematics and science in a more personal context, and trains children to develop critical thinking skills that can be applied to all aspects of their work and academic life.

Support of learning video shows in accordance with themes and topics of discussion on pre-play support provides new insights to children, new experiences and knowledge to explore old knowledge, build children's imagination and creativity when entering core activities. The instructional video shows allow children to understand more deeply about the five components in the STEAM content. So that children can easily apply what they have learned and seen through video shows using the LCD by utilizing learning resources from the internet, enabling students to explore core activities with STEAM content in more detail and practice.

Integrating technology into inquiry-based early childhood learning. Based on the existing theoretical framework, this study suggests the use of learning technology in early childhood education by a) enriching and providing a structure for the problem context, b) providing resource utilization facilities, and c) providing support for cognitive and metacognitive processes. (Wang, F., Kinzie, M. B., Mc Guire, P., & Pan, E. (2010: 381 - 389).

3   Result and Discussion

STEAM classroom learning videos. The learning process is carried out through preliminary, core, and closing activities. Preliminary activities are carried out to open students' understanding of the initial knowledge that has been mastered followed by the delivery of learning objectives so that it creates a high curiosity. To build children's curiosity, the teacher uses instructional video shows according to a theme or topic as support before playing. By showing learning videos, children's curiosity can be a strong basis for developing ideas and creativity in core activities. In the core activities, children carry out learning activities by combining five fields of knowledge in one learning activity and children's play so that they become focused and meaningful.

The teacher in addition to utilizing instructional video media also utilizes storybooks that are in accordance with the discussion of the theme to build knowledge concepts in

children using storybooks containing STEAM or teaching aids. The teacher chats with the child and invites the child to think by asking "what", "why", "how", and so on related to the topic of discussion.

a. STEAM content in learning

STEAM content builds children's knowledge about the world around them through observing, questioning, and investigating. The five disciplines are built around a STEAM classroom approach. Video shows of learning conducted during children's play support provide new ideas, ideas, and inspiration for children to build their imagination and produce works. Children can also explain how their work is born from old knowledge and new knowledge obtained from showing instructional videos related to the topic of discussion and is used as a basis for children to produce works with all their arguments.

Learning in PAUD based on Science, Technology, Engineering, Art, and Mathematics (STEAM) is integrated. Loose parts (loose materials) are an important element in learning with STEAM. Loose parts, as open items, can be easily found in the child's environment. Nature provides many loose parts, such as tree branches, seeds, shells, rocks, leaves, flowers, and other natural objects. Parents, teachers, and children can collect loose parts from anywhere, without having to spend money. Loose parts support children's development and can help connect children with their surroundings. (Wanghuyungsih. S.et.al. 2019).

STEAM is used in an integrated understanding of the disciplines of science, technology, engineering, arts, and mathematics and the importance of children in long-term success in academics and economic well- being (Quigley & Herro, 2016), as well as community development (Han, Rosli, Capraro, & Capraro, 2016). Education with STEAM content includes the values of life from preschool to post-doctoral level and arrangements for formal education in the classroom and informal education such as afterschool programs and even playing at home (Gonzalez & Kuenzi, 2012). STEM-based education is recognized in the United States as a reform in education as an instructional approach to preparing children for the 21st-century global economy (Yakman & Lee, 2012).

Learning using STEAM content encourages children to develop curiosity, openness in experience (Perignat & Katz-Buonincontro, 2019), and children ask questions so that their knowledge is built by exploring, the process of observing, finding, and children investigating something around them (Munawar, 2019).

STEAM is focused on creating the final product and how the process is made. In the manufacturing process it is very important compared to the final product because in the manufacturing process children explore, think creatively, design techniques, creative expression, evaluate, and redesign (Perignat & Katz- Buonincontro, 2019). STEAM teaches process through children's activities by observing, playing, recognizing patterns, and training creative thinking skills, collaboration, and communication skills between children in completing assignments or projects facilitated by teachers (Guyotte, KW, Sochacka, NW, Costantino, TE, Walther, J., & Kellam, 2014) During the process, children are required to think creatively and critically in something new. Children are encouraged to solve problems with teachers and peers. (Michaud, 2014).

Creativity in the classroom, for example, develops a supportive environment where students feel compelled to think, explore, play, observe, reflect, and ask unusual questions. Learning creativity through examples and direct practice, therefore teachers can become creative behavior models and be able to build creatively in students (Perignat & Katz-Buonincontro, 2019). With a supportive environment, children are able to make connections between learning materials, the surrounding environment, and learning designs.

Difficulty faced

The results showed the level of difficulty faced by the teacher in implementing the results of the instructional video shows to strengthen the STEAM content in the PAUD class in terms of (1) Difficulty in choosing a video display according to the topic of discussion. (2) Guiding children to explore through open-ended questions based on the results of the video. (3) Limitations in exploring broadcast media and loose parts used as children's play materials so as to be able to develop STEAM content in an integrated manner. (4) The teacher's ability to provoke in supporting the child's inquiry process. (5) There is still a lack of support and understanding from parents regarding early childhood learning through play.

4 Conclusion

Presentation of learning video shows according to the topic of discussion and the application of learning methods with STEAM (Science Technology Engineering Art and Mathematics) content in PAUD Nurul Hidayah to improve learning as a method in teaching and learning activities. Where children are stimulated back to their old knowledge and get new knowledge to strengthen children's ideas during core activities by interacting directly through observing, questioning, reasoning, gathering information, and communicating. Children gain knowledge through mathematical logic and art which includes an understanding of numbers, blocks, geometric shapes, classifications, and works from the surrounding environment.

By using learning video shows to strengthen STEAM content, it is hoped that it can increase creativity, innovation, and early childhood learning. The success of the learning process is determined by the learning methods used and the professionalism of teachers in managing teaching and learning activities. So that the implementation of the STEAM method is very feasible to use to improve learning for early childhood who are ready to live in the 21st-century era.

References

1. Aminah. Siti. Pengembangan Video Animasi Sebagai Media Pembelajaran Untuk Meningkatkan Kosa Kata Pada Anak Usia 4–5 Tahun. Lampung. 2019
2. Arsyad Azhar, Media Pembelajaran, (Jakarta: Rajawali Pers, 2013)
3. Gonzalez, H. B., & Kuenzi, J. (2012). What Is STEM Education and Why Is It Important? Congressional Research Service

4. 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.
5. Han, S., Rosli, R., Capraro, M. M., & Capraro, R. M. (2016). The effect of Science, technology, engineering and mathematics (STEM) project based learning (PBL) on students' Achievement in four mathematics topics. Journal of Turkish Science Education. https://doi.org/10.12973/tused.10168a
6. Jurnal Obsesi : Jurnal Pendidikan Anak Usia Dini. Surakarta.2019
7. Michaud, M. R. (2014). STEAM : Adding Art to STEM education. District Administration, 50(1), 64. Morisson. George. 2012. Dasar-Dasar Pendidikan Anak Usia Dini. Jakarta: PTIndeks
8. Munawar, D. (2019). Implementation of STEAM (Science Technology Engineering Art Mathematics)- based early childhood education learning in Semarang City. Jurnal Ceria, 2(5), 2714–4107.
9. Perignat, E., & Katz-Buonincontro, J. (2019). STEAM in practice and research: An integrative literature review. Thinking Skills and Creativity. https://doi.org/10.1016/j.tsc.2018.10.002
10. Quigley, C. F., & Herro, D. (2016). "Finding the Joy in the Unknown": Implementation of STEAM Teaching Practices in Middle School Science and Math Classrooms. Journal of Science Education and Technology. https://doi.org/10.1007/s10956-016-9602-z
11. Sanaky, AH, Hujair. (2011). Media Pembelajaran Buku Pegangan Wajib Guru dan Dosen. Yogyakarta: Kaukaba.
12. Siti Wahyuningsih1, Adriani Rahma Pudyaningtyas2, Ruli Hafidah3, Muhammad Munif Syamsuddin4, Upik Elok Endang Rasmani5, Novita Eka Nurjanah6. Efek Metode STEAM pada Kreatifitas Anak Usia 5–6 Tahun. Volume 4 Issue 1 (2020) Pages 305–311
13. Sujiono.Yuliani. 2013. Konsep Dasar Pendidikan Anak Usia Dini. Jakarta: PT Indeks
14. Wang, F., Kinzie, M. B., Mc Guire, P., & Pan, E. (2010). Applying Technology to Inquiry Base Learning in Early Childhood Education. Early childhood education journal, 37 (5), 381 – 389.
15. Yakman, G., & Lee, H. (2012). Exploring the Exemplary STEAM Education in the U.S. as a Practical Educational Framework for Korea. Journal of The Korean Association For Science Education. https://doi.org/10.14697/jkase.2012.32.6.1072