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IMPLEMENTATION OF STEAM IN LOWER CLASS PRIMARY SCHOOLS

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ABSTRACT

Preparing generasi demi meneruskan nation became fundamental in facing transition or development of in the era in beginning of abad ke 21 this. Hal What can be prepared is the right teaching method so that each school can produce human resources with quality.STEAM or Science, Technology, Engineering and Mathematics is a learning method that focuses on developing skills to face the 21st century, especially in the field of basic education. Meanwhile, this research aims to identify how and implement the STEAM method at the elementary school level on an international or national scale. SLR is a method used in conjunction with , a qualitative approach, or also called meta-synthesis. The literature study used was 5 journals obtained via Google Scholar. After conducting a literature study, it can be found that the implementation of STEAM in elementary schools in Indonesia is to guide students to ask questions, prepare project plans, prepare, a schedule, carry out monitoring, carry out tests and assess, and evaluate and experiences. Then in schools based on international, the implementation of STEAM is recognizing various material components, then designing components, implementing then presenting there is a activity or a project created by together. STEAM will give a impact that has for students, especially in soft skills and outcome skills.

Keywords: *Primary School; Steam Learning*.

INTRODUCTION

The 21st century forces all humans to have skills, especially in the field of education. Skills are a guarantee that within a student there is , askill to learn, to innovate, to be a user of technology and information, to be able to work actively, and can defend withusing the skills possessed by (Andrian & Rusman, 2019). In research conducted by Ozturk (2022) stated that skills in the 21st century are a way to express the characteristics possessed by an individual in becoming a citizen of a country. Apart from that, a main skill that continues to be discussed and is needed in the 21st century is development in cognitive skills, behavior, or emotional attitudes that a person shows both at school and outside of school.

St Louis et al.,(2021) also believes that skills in the 21st century are a development of a skillwhich includes creativity, critical thinking, innovation, *problem solving,Decision making, learning ability, being able to communicate well,* collaborates between skill development and information technology for the future of children who are ready to compete.*Skills are important for students to have at school, so that skills itself becomes a "lesson" that must be applied. In the 21st century, developments from one era to a new era will occur, for example, primitive societies change into agrarian, industrial and informative societies with the development of digitalization in* (Rahayu et al., 2022).

In the field of Education itself, various types of challenges continue to occur due to the increasing development of science and also developments and innovations in technology. The global Education sector pays attention to the latest innovations, namely STEAM as an acronym forScience, Technology, Engineering, Mathematics(Li et al. , 2019; Teo & Ke, 2014). Steam is a learning trend used in elementary schools on a national scale or *on an international* scale (H. Lee et al., 2022; Nurwulan, 2020).In its application in the field of keepeducation, STEAM is able to build , a skill in the 21st century, including creativity, critical thinking, collaboration and communication where children are given encouragement to be able to identify problems, then create a solution to the problem, then collaborate with friends. , then explains the ideas that has more effectively in live (H. Lee et al., 2022; Nuragnia et al., 2021; Thovawira et al., 2021).

Hadinugrahaningsih et al., (2017) provides an understanding of STEAM as a learning model with Juanfor the sake of developing children's soft skills, and linking them to science and technology, searching for literature and conducting reviews of it, the fields of engineering, arts and also mathematics whose development is carried out holistically .

STEAM is a learning that invites children to understand what is in the environment around them, so that children are able to explore according to the capabilities that has. Application ofa kcollaboration, as well as collaboration and alsocommunication in a the learning process is carried out by use stimulates abilities that make children responsible and solve problems well. Children are also expected to be able to develop an understanding of the material the teacher has presented. STEAM requires students to identify a problem, then create a solution as a team in order to improve communication skills and share ideas between members of the group (Kemendikbudristek, 2021).This approach is used to provide students with an understanding of the initial learning process, because knowledge and skills can be instilled in students through STEAM learning.

The Indonesian government has recognized the existence of alternative education or what is known as equality education as stated in the National Education System Law No. 20 of 2003, while it is explicitly stated that equality education is part of a program rather than a non-formal education pathway (Mutaqim, 2022).

Education in the current era faces quite a complex situation along with adjustments changes simultaneously with technological disruption. Then those changes has implications for the learning process which usually uses a learning approach oriented towards the transfer of knowledge into learning by constructing experience learners. Learning carried out in alternative education such as equality education currently held by the PKBM unit does not show good climatic conditions and learning outcome orientation (Rosmilawati, 2023).

RESEARCH METHODS

In this research, Literature study**is used** with the SystematicReview (SR) orbis methoda is calledSystematic Literature Review (SLR). This method is a system for collecting. Carrying out critical tests, as well as integrating and collecting various results that have been studied from questions and research or topics to be discussed. Research will begin by looking for articles that are related to the topic you want to research.Next, there will be a systematic review or method that carries out a review of a problem by identifying and evaluating the problem that has been selected and asking questions about the review that has been carried out.

This is based on research that has been carried out previously which is of quality and relevant to the question to be researched. Systematic Literature Review (SLR) is a method that works systematically and explicitly to carry out , a identification of problems. Evaluation and synthesis are carried out on the work and research results as well as the results of thoughts that have previously been carried out. The aim is to identify and review, then evaluate the research that has been determined by this research: how is STEAM implemented in National Elementary Schools?

Result and findingssteam is a new innovation in the world of education by combining several components in science into one unified learning concept. Before STEAM existed, the concept of STEM first emerged without any art. The Ministry of Education and Culture states that learning with the STEAM approach is an approach that focuses on the relationship between knowledge and skills which aims to overcome problems. STEAM is an abbreviation for Science, Technology, Engineering, Art, and Mathematics (Kim & Park, 2012; Tabiin, 2020; How & Hung, 2019).

Experts define STEAM with different opinions. According to Anggraeni (2021) STEAM is learning that uses the approach, student activity, itself,, combining one STEAM discipline with another discipline. Pasani and Amelia (2021) describe STEAM as a approach which focuses on in, the process of solving , aproblem, with , the integration of five disciplines including Engineering, Technology, Science, , and Mathematics.

According to Liliawati et al. (2018) STEAM is , a learning approach where the artistic elements of have a strong impact on, is rich in and positive , because is expected to make learning become more meaningful and effective. From several expert opinions, it can be concluded that STEAM is keilmuan which combines science, technology, art, and mathematics, and engineering into an integrated approach which can be applied onschool learning.

When is a teaching and learning process, STEAM-based learning is important to apply because it has several benefits, including being able to preparing the nation's next generation who are ready to menfacing the era of development, helping in developinginnovation in life, increasing students' interest in work in STEAM, making learning more in tune with life, helping students build self-concept actively, and increasing students' literacy about STEAM.

Century skills.In the application of STEAM-based learning, students are encouraged to be able to find steps that are repeatedbutsystematic in designingan object, steps, and a system of use fulfillment of human desires and needs (engineering). technical elements in STEAM can starts from , a problem,, desires, and needs with , measurable characteristics of, , then tested, use, explains existing limitations.

In developing STEAM innovation, it can be applied by setting up processes that uses engineers when creates a product or or technology that uses in accordance with predetermined criteria. The process is known as Engineering Design Process (EDP). . From a systematic review of on lite.. researchers found 19 empirical studies of in accordance with criteria in this research and these findings answered from review questions.

Research and Year of Research Journal Research Results Andrian, Y., & Rusman, R. (2019) Implementation of 21st century learning in the 2013 curriculum results from research shows that application of century learning ke-21inTransla Docs in the 2013 Curriculum in Physics lessons at DKI Jakarta Reference High School has positive results. The following are the findings of this research: 1) Learning planning is in the good category which has a score between 23-27. 2) Assessment of from

learning is considered good with a score between 29-34. in the good category with		**scores between 46-55.**
4) Supervision of	from	learning also da in good category with scores 23-27. Thus, concluded that the implementation of 21st century learning in the 2013 Curriculum in Physics lessons at DKI Reference High Schools Jakarta has been running smoothly both and assessments of the respondents, namely Physics subject teachers

		who were involved in the research. Atmojo, I.R.W., Ardiansyah, R., Saputri, D.Y., Mulyono, H., & Adi, F.P. (2020)Implementation Science, Technology, Tran based learningslaDocsEngeneering, Art, and mathematich (STEAM) to Improve the Pedagogical and Professional Competence of Elementary School Teachers Through the Lesson Study MethodPtranslaDocstranslaDocs-based learning method STEAM has provided a significant improvement in the professional and pedagogical competence of elementary school teachers in Surakarta. The training and workshops conducted have shown a positive impact on teachers' abilities in creating technology-based evaluation instruments,

		as well as their skills in using applications such as Edmodo for Learning Management Systems (LMS). This research also highlights the importance of collaborative learning and continuous professional development for educators, emphasizing the need for implementing the Lesson Study model in a continuous for acceleratedimproveme nt ofpedagogical and professional competence. Bin Amiruddin, M. Z., Magfiroh, D. R., Savitri, I., & Binti Rahman, S. M. I. (2022) Analysis of the Application of the STEAM Approach to Learning in Indonesia: Contribution to Physics Education The implementation of the STEAM approach in physics learning has proven to be effective in increasing students' mastery of the concept of mechanical waves in simple pendulum

		oscillations. The application of STEAM is not only focused on one level of education, but also applied at the Middle and High School levels as well as in
various subjects. The application of STEAM can help develop students' skills in the 21st century along with technological developments and increasing demands in modern times. STEAM-based learning encourages students to discover Systematic steps in the process of	and designing objects, andsystem which meets human needs, using the Engineering Design Process (EDP). STEAM learning can help students integrate each STEAM component in physics learning, making it easier for them to understand concepts. Mu'minah, I.H & Suryaningsih, Y. (2020).Implementation ofLearning based on Science, Technology, Engineering, Art and Mathematics (STEAM) to Improve the Pedagogical Competence of	and Professional Elementary School Teachers Through the Lesson Study MethodFrom pre-test and post-test results that has carried out previously, finds facts if provides training cseffect that sufficientsignificant onteacher competency . training here
about	how to create	LMS with the Edmodo Application. This workshop activity brought in speakers who were experts in in the field which did not directly give a positive effect with good communication. Rosmawaty (2010)

		explains group communication is
communication	more than 2 , with the aim of sharing information, developing	ideas and solving problems, formally or informally . formal situation during Trainingwill helpsolveproblems faced by teachers inhal create an LMS with the Edmodo ApplicationNuragnia,B.,Nadiroh,&Usman,H.(2021) Steam Learning in Elementary Schools: Implementation and Challenges.Results from researched data shows cs50% of32 respondents is a teacher who has following the workshop STEAM. Teachers feel that the workshop STEAM provides benefits regarding learning models and methods that can use inclasses. In addition, teachers felt that STEAM training, implementing learning that was more interesting, would increase students' motivation.PSTEAM training provides added knowledge
teacheronlearning based		case studies and translaDocs projects can facilitatestudentsNurwulan, N. R.

		(2020).Introduction of STEAM Learning Methods to School Level Students Elementary Grades 1 to 3. participants who take part in community service are elementary school students in grades 1-3 Madrasah Ibtidaiyah Istiqomah Bogor. The choice of is because it is hoped that this can be a motivation for their if science and mathematics are easy to learn. *(Children's Learning World, 2019)*, which explains about Experiments on making rainbows from sugar coating, rainRainbow by (Kak Zepe, 2017), and abilities plants absorb water (osmosis) (Children's Learning World, 2018) was chosen as STEAM material because it is close and can be seen directly.Sumaya, A., Israwaty, I., & Ilmi, N. (2021).Application of STEM Approaches to Improve Results Learning for Elementary School StudentsIn Pinrang Regency.The aim of this research isthe application of the Learning Discovery

		method to improve student learning outcomes. Thismethod prevents students from getting bored with in learning . This research also looks at how teachers manage this method. P in the first cycle of , the result was that the teacher was active enough to increase the teacher's activity and received an active category, as well as in session II, which means this method was successful. for learning to teach. Meanwhile, in, student activity in cycle I was quite active, was also quite active in session II, , and cycle II in the first and second sessions was very active in when learning was taking place.
. Transla Docs Based on the	description of	in the session I TranslaDoc there was a deficiency, so continued in the II session. In the session II, teachers began to get used to by applying the Discovery Learning method when teachingIPA which actively involves students. The results of the student activity
in the	II session received in the excellent category.	Even though in the s session I, had not yet achieved ideal criteria,

		because students were less active in,was less motivated, and ignored group work because students were not used to this method. In contrast to session I, in session II students were more active because they began to understand this method through observations which attracted students' attention to actively learn. How does implement STEAM in National Primary Schools? Mu'minah & Suryaningsih (2020) Empirical Research iniimplements at stage application of STEAM (Science, Technology, Engineering, Mathematics) at studentsTranslaDo cs through , a project, the are required to understand about project material as a knowledge , with the use of technology, is able to create skills in the 21st century. Several project-based applications of STEAM, including: Giving an overview of the beginnings that students have with p as well as questions which are eessential. Developing a

		project plan with group discussion, is looking for information about how completes projects and what obstacles that faces by considering how long it takes to complete STEAM.Preparing a schedule for completing projects.Monitoring development sproyek

To see how far the project has been made.Assessment and evaluation by teachers of projects that students have worked on. Evaluating Experience Here students are asked to make conclusions and his feelings when the work process was completed. After that, the teacher will make a reflection as an evaluation for students. CONCLUSION STEAM is 21st century learning model with aims to develop softskill students and connects it with science, development of technology,tTranslaDoctechnics, arts, TranslaDos cs and mathematics by concluding it with experience in the 21st century.STEAM Learning is a contextual learning, where studentsexplores allskillthat has to understand phenomena that occur inthe scope of life so that children are able to createdifferent works.

REFERENCE

Andrian,Y.,&Rusman,R.(2019). Implementasi pembelajaran abad 21 dalam kurikulum 2013. Jurnal Penelitian Ilmu Pendidikan, 12(1), 14–23. https://doi.org/10.21831/jpipfip.v12i1.20116

Atmojo, I. R. W., Ardiansyah, R., Saputri, D. Y., Mulyono, H., & Adi, F. P. (2020). Implementasi Pembelajaran Berbasis Science, Technology, Engenering, Art And Mathematich (STEAM) untuk Meningkatkan Kompetensi Paedagogik dan Professional Guru SD Melalui Metode Lesson Study. Jurnal Pendidikan Dasar, 8(2), 119–123. https://jurnal.uns.ac.id/JPD/article/view/45207

Bin Amiruddin, M. Z., Magfiroh, D. R., Savitri, I., & Binti Rahman, S. M. I. (2022). Analysis of The Application of The STEAM Approach to Learning In Indonesia: Contributions to Physics Education.International Journal of Current Educational Research 1(1), 1-17,https://doi.org/10.53621/ijocer.v1i1.139

Mu'minah, I. H., & Suryaningsih, Y.-. (2020). Implementasi Steam (Science, Technology, Engineering, Art And Mathematics) Dalam Pembelajaran Abad 21. BIO EDUCATIO : (The Journal of Science and Biology Education), 5(1), 65–73. https://doi.org/10.31949/be.v5i1.2105

Mutaqin, M. F. T., Haila, H., & Sudadio, S. (2022). GRATITUDE IN LIMITATIONS: A MEANING OF CITIZENS LEARNING NON-FORMAL EDUCATION IN COMMUNITY INSTITUTIONS. Journal of the Existence of Out-of-School Education (E-Plus), 7(2).

Nuragnia, B., Nadiroh, & Usman, H. (2021). Pembelajaran Steam Di Sekolah Dasar : Implementasi Dan Tantangan. Jurnal Pendidikan Dan Kebudayaan, 6(2), 187–197. https://doi.org/10.24832/jpnk.v6i2.2388

Nurwulan, N. R. (2020). Pengenalan Metode Pembelajaran STEAM Kepada Para Siswa Tingkat Sekolah Dasar Kelas 1 Sampai 3. Jurnal Madaniya, 1(3), 140–146. https://madaniya.pustaka.my.id/journals/contents/article/view/29

Rosmilawati, I., Mutaqin, M. F. T., & Sholih, S. (2023, October). STRENGTHENING THE COMPETENCE OF PKBM TUTORS IN DEVELOPING TRANSFORMATIVE LEARNING-BASED TEACHING STRATEGIES. In Proceedings of the National Seminar on Non-Formal Education (Vol. 1 0.