

Descriptive Study on Kindergarten Teachers' Perceptions of the Implementation of STEAM-Based Merdeka Curriculum in Kindergarten Education in West Java Province Region

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Abstract

This article aims to describe kindergarten teachers' perceptions on the implementation of Merdeka Curriculum based on STEAM in kindergarten education in West Java Province. A quantitative descriptive study was conducted with 44 respondents from 44 kindergartens in the province. The participants, who had been teaching for between one and 30 years, were all kindergarten teachers. The research sample was identified through purposive sampling, following the minimum number of research participants required for descriptive research. Data were gathered through questionnaires to provide a description. Teachers' views on Merdeka Curriculum with focus on STEAM include (1) insights on its implementation in early childhood education and (2) perspectives on integrating Science, Technology, Engineering, Arts and Mathematics (STEAM) in early childhood education. (3) The main benefits of implementing the Merdeka Curriculum based on STEAM in kindergarten, and (4) the primary challenge in implementing the Merdeka Curriculum based on STEAM in kindergarten, as perceived objectively.

1. Introduction

1.1 Policy Implementation of the Merdeka Curriculum in Indonesia

The creation of Indonesia's Merdeka Curriculum arose from the difficulties posed by the paradigm shift that's occurring across all facets of human existence, including education, with regards to the 21st century learning paradigm. Indonesian education is presently encountering several challenges, particularly during Indonesia's golden phase, which encompasses the centenary of Indonesia's independence in 2045. In addition, the globalisation of education, predicted to occur in 2030, presents a challenge that has already brought about many changes in various aspects of life. Unfortunately, the situation has worsened due to the impact of the Covid-19 pandemic resulting in significant learning loss, as reported by the Indonesian Ministry of Education, Culture, Research and Technology's research. This phenomenon of learning loss refers to the decline in academic knowledge and skills of students caused by prolonged time spent learning at home. Education providers must act swiftly to enhance students' preparedness as future generations able to adapt to changing times through

curriculum policies. A good and suited curriculum plays a crucial role in the success of education, as it is the foundation of quality education.

The Merdeka Belajar Curriculum was designed by the Ministry of Education and Culture to overcome the crisis and various challenges of these new and changing times. Within this curriculum, teachers have the freedom to design strategies, teaching methods and the material taught in class with the aim of facilitating student learning [6]. The content is optimised, providing learners with adequate time to explore concepts and enhance competencies. Various competencies, such as attitude, knowledge, and skills, need to be developed to prepare learners for the future [10].

In August 2021, amid the ongoing pandemic, the government implemented a simplified curriculum, referred to as the emergency curriculum. The Decree of the Minister of Education and Culture Number 719/P/2020 outlines the details of this policy, which streamlines the 2013 curriculum. According to Puskurbuk (2020), Indonesian educators continue to encounter challenges when preparing administrative materials. Research by Aeni (2019) suggests that teachers lack motivation to create lesson plans as they perceive the learning process in the classroom as more significant than producing complex plans. Lesson Plan (LP) is a document created from the syllabus to achieve Basic Competencies, outlining learning activities for a single session. Despite this, educators often struggle to produce effective LPs.

The curriculum should aim to be flexible enough to meet the requirements of students and attain the desired competencies. Li et al. (2021) conducted research concluding that the assessment of education during the pandemic presents numerous suggestions for adapting the curriculum to current circumstances and avoiding adding pressure on students to learn. From the various evaluations and reviews, it is necessary to refine and adapt the curriculum in Indonesia to current requirements, in order to enhance students' learning outcomes [8].

The Merdeka curriculum has been designed with the following key principles in mind: 1) disciplinary achievement standards that focus on stability, coherence, and concentration; 2) the development of interdisciplinary skills, abilities to transfer knowledge, and a variety of choices; 3) authenticity, flexibility, and harmony; and 4) the empowerment and independence of both students and teachers. The underlying philosophy of independent learning forms the main basis of the curriculum design and is in line with other educational policies outlined in the Ministry of Education and Culture's Strategic Plan for 2020-2024.

The paradigm shift aims to enhance the autonomy of teachers as controllers of the learning process. This entails relinquishing the control of prescriptive standards and rejecting the uniformity of learning processes in all Indonesian educational facilities. The implementation of this autonomous curriculum will enable participants to exercise their rights and abilities to determine their own learning process by establishing learning objectives, reflecting on their abilities, and taking proactive and responsible measures for their own achievement. The suggestion is that teachers themselves must possess the skills to prepare the learning process efficiently in order to attain the anticipated learning objectives. In addition to the four guiding principles for designing a Merdeka curriculum, the following principles are straightforward, comprehensible, and emphasize competency and character development of learners. They are flexible, cooperative, harmonious, and give regard to research findings and feedback. In the current curriculum reform, it is referred to as the Merdeka curriculum, also known as the concept of Merdeka Belajar. According to Ainia (2020), the Merdeka Belajar curriculum aligns with the educational ideals of Ki Hajar Dewantara, a national figure in education. The curriculum emphasises independent and creative learning, which can shape students into independent individuals with strong character. There are several Merdeka curriculum policies, including the replacement of USBN with competency assessment, replacing the national exam with a minimal competency assessment and character survey, and streamlining the Learning Implementation Plan. Previously containing 20 pages, it now only consists of one page, which contains three components: learning objectives, learning activities, and assessment [17].

Ultimately, the Merdeka Curriculum aims to overcome the learning crisis by improving the quality of learning in all educational units. The curriculum creates a secure, welcoming, inclusive, and enjoyable learning environment. Through this learner-centred approach, the Merdeka Curriculum seeks to improve literacy and numeracy outcomes and shape individuals into lifelong learners with good character. According to the Minister of Education and Culture, the Merdeka Curriculum prioritizes independent learning through its implementation, which entails a fun and interactive learning process. Innovative thinking from teachers is critical to its success as it fosters students' positive attitudes towards learning [5]. This curriculum aims to establish educational objectives that foster children's analytical and reasoning skills, as well as a broad and complex understanding. It can also help children to develop themselves in various areas beyond cognitive development. Memorization, while important, is not the sole focus.

The implementation of the Merdeka Curriculum in early childhood education, known as independent play, is closely related to the concept of learning through play. Given this, Merdeka Belajar is a fitting concept to apply and develop in Early Childhood Education (PAUD). Every child attending the PAUD unit will enjoy learning without drills or mindless memorization. They will not be burdened with Children's Worksheets (LKA) or CALISTUNG, which can hinder their development at this stage of exploration and play.

The implications of the Merdeka curriculum in early childhood education, including education in kindergarten, are carried out in accordance with the policy bases. The basic policies that become the foothold are: (1) Permendikbudristek No. 5 of 2002 concerning Graduate Competency Standards in Early Childhood Education, Basic Education, and Secondary Education; (2) Permendikbudristek No. 7 of 2022 concerning Content Standards in Early Childhood Education, Basic Education, and Secondary Education; (3) Kemendikbudristek No. 56 of 2022 concerning Guidelines for Curriculum Implementation and Learning Recovery Framework; (4) Decree of the Head of BSKAP No. 008/H/KR/2022 of 2022 concerning Learning Outcomes in Early Childhood Education, Primary Education and Secondary Education in the Merdeka Curriculum; (5) BSKAP Decree No. 009/H/KR/2022 of 2022 concerning Dimensions, Elements, and Sub-Elements of the Pancasila Learner Profile in the Merdeka Curriculum.

The main characteristics of the Merdeka curriculum in PAUD units include: strengthening meaningful play activities as a learning process, strengthening the relevance of PAUD as a foundation phase, strengthening the love of literacy and numeracy from an early age, a project to strengthen the profile of Pancasila students, a more flexible learning and assessment process, assessment results are used as a basis for teachers to design play activities and foothold parents to invite children to play at home, strengthening the role of parents as unit partners. PAUD units can implement Merdeka curriculum in stages according to their readiness. The first option is independent learning. If the PAUD unit chooses this option, the education unit can implement some parts and principles of the Merdeka curriculum without replacing the education unit curriculum that has been implemented. The second option is independent change. This option is applied by education units by implementing Merdeka curriculum using teaching tools that have been provided in PAUD units. The third option is independent sharing. In this option, PAUD units implement Merdeka curriculum by developing various teaching tools themselves in PAUD units.

1.2 STEAM-based Merdeka Curriculum in Kindergarten

The learning activities employed in the Merdeka Curriculum for early childhood education, including kindergarten, involve the application of Merdeka Bermain. This program is designed to stimulate children's high order thinking skills, which go beyond mere knowledge retention and recollection. By participating in the program, children are encouraged to apply, evaluate and even create according to their own ideas. Learning activities with objectives that develop high-level thinking skills require careful preparation to design activities, select media, themes, and sub-themes, as well as determine methods or approaches to include children's emotions. STEAM-based learning approaches are the primary option in this new curriculum. STEAM is an approach that seeks to bring together five disciplines to create a joyful learning experience. The term STEAM represents Science, Technology, Engineering, Arts and Mathematics. The implementation of activities that follow this approach allows for the integration of these five disciplines in a seamless manner, without any segregation, which can provide additional stimulation for children during lessons. It aligns with early childhood development, which is still in the sensory-motor and preoperational stages and necessitates direct learning or tactile resources [13].

STEAM is an approach that prioritises character development and does not solely focus on a specific field in contrast to the STEM concept. The aim of STEM is to foster 4C skills (Critical Thinking, Communication, Collaboration, Creativity and Innovation), develop innovative problem-solving techniques, and adapt to labour market requirements. According to Arsanti et al. (2021), these skills are essential for coping with the challenges of society 5.0 in the 21st century. The era of the highly intelligent society. This period anticipates the turbulence of disruption caused by the Fourth Industrial Revolution, resulting in complex and vague uncertainty (VUCA). It is feared that these innovations could erode the values of human character that have been preserved so far. This ability is not only developed at the lower and higher levels of education, but also can be initiated from basic education, namely PAUD.

The National Curriculum Information System (n.d.) defines the Merdeka Curriculum as a programme that can enhance children's critical, creative, and collaborative thinking abilities in line with the Pancasila Student Profile. Such abilities are crucial 21st-century skills, particularly as we enter the era of Society 5.0, a hyper-connected and highly advanced society. These skills may be acquired through utilization of the STEAM method, an educational approach included in one of the learning objectives of the Merdeka Curriculum.

The application of STEM Education focuses on developing problem-solving and critical analysis skills while providing materials relating to science, technology, engineering and mathematics. STEM is not limited to upper secondary education or high school; the pedagogical concept of STEM can be taught by teachers from kindergarten (TK) to high school (SMA) [16], [11]. Implementing STEM in education integrated with pedagogy emphasizes the use of STEM concepts in designing, developing, embedding, managing, and evaluating processes and resources in learning.

As argued by Jolly (2014) and Utley (2020), STEM Education cannot be fully defined by the individual concepts of science, technology, engineering, and mathematics alone. The application of technology in STEM Education, for instance, encompasses the use of multimedia tools such as PowerPoint, Blackboard, digital assessment programmes, web-based tools, DVDs and videos.

STEM education applied at different education levels, namely Kindergarten (TK), Elementary School (SD), High School (SMP), and SMA, will vary significantly. If STEM is introduced in Kindergarten, teachers can initiate discussions when children are drawing, exploring STEM concepts through the process. STEM can be integrated by providing children with multi-sensory experiences and by encouraging the use of verbal language. Even inviting children to explore a concept scientifically constitutes a part of the utilization of STEM in kindergarten learning (Juliana Utley, 2020).

2. RESEARCH METHODS

This study is a quantitative descriptive research with a sample population of kindergarten teachers from West Java Province. The sampling technique applied was purposive random sampling, enabling the research objectives to be met through a random selection process. The research sample consisted of 44 kindergarten teachers from the West Java region. The determination of the sample size is based on Roscoe's (1975) recommendation that it should be within the range of 30 to 500. To collect data on kindergarten teachers' perceptions of the STEAM-based Merdeka Curriculum in West Java Province, a closed questionnaire consisting of four items was employed as the data collection technique.

3. RESULTS AND DISCUSSION

The results of research related to kindergarten teachers' perceptions of the STEAM-based Merdeka Curriculum are classified into four related perceptions: (1) perceptions related to the use of the STEAM-based Merdeka curriculum in learning Kindergarten-age children; (2) perceptions related to the use of methods that link science/technology/art/engineering (STEAM) in learning Kindergarten-age children; (3) perceptions related to the main benefits of implementing the STEAM-based Merdeka Curriculum in Kindergarten; and (4) perceptions related to the main obstacles or challenges in implementing the STEAM-based Merdeka Curriculum in Kindergarten. The research results show the following:

- (1) Perceptions related to the use of the STEAM-based Merdeka curriculum in kindergarten-age children's learning

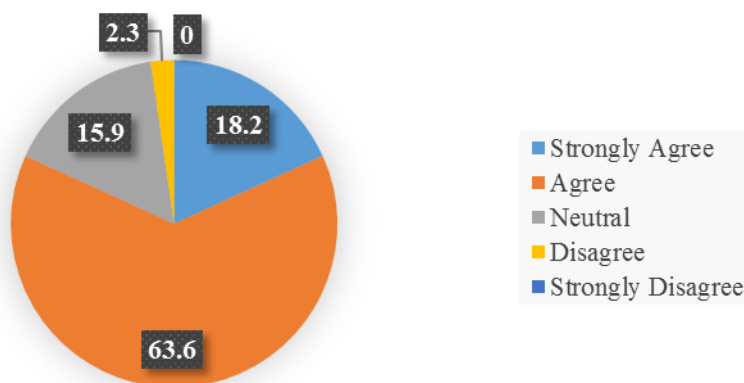


Diagram 1. Perceptions of the use of STEAM-based Merdeka Curriculum in kindergarten

This data shows that a majority of teachers have a positive view of the STEAM-based Merdeka Curriculum in kindergarten education. Specifically, 63.6% of respondents "Agree" with its use, while 18.2% "Strongly Agree," indicating a notable consensus on the curriculum's effectiveness. Only a minimal 2.3% "Disagree," which suggests some reservations, although this is a small dissenting fraction. Furthermore, 15.9% remain "Neutral" on the subject, indicating a degree of ambivalence or the need for more information. There are no respondents who "Strongly Disagree," highlighting the absence of strong opposition within this sample of educators. Overall, this data underscores the prevailing positive sentiment and support for the implementation of the STEAM-based Merdeka Curriculum in kindergarten education, indicative of its perceived value in promoting interdisciplinary and experiential learning in the early stages of a child's education.

(2) Perceptions related to the use of methods that link science/technology/art/engineering (STEAM) in kindergarten-age children's learning.

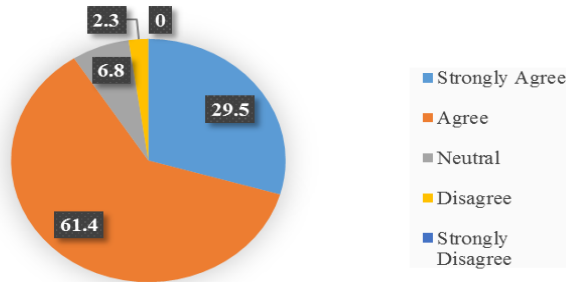


Diagram 2: Perceptions of the use of science/technology/art/engineering (STEAM) methods in kindergartens perceptions regarding the main benefits of implementing the STEAM-based Merdeka Curriculum in kindergarten

In the context of early years education, the data emphasises teachers' perceptions of the integration of Science, Technology, Engineering, Arts, and Mathematics (STEAM) methodologies into learning experiences for kindergarten-aged children. The statistics provided indicate that a significant majority of teachers hold a positive outlook towards incorporating STEAM methods into the curriculum for kindergarten. A significant proportion of educators, 61.4% to be precise, express agreement with the use of multidisciplinary methods and a further 29.5% "Strongly Agree." This concordance with STEAM strategies indicates teachers' recognition of the potential advantages for enhancing young learners' cognitive and creative development. However, it is worth noting that 6.8% of teachers remain "Neutral" on the issue, possibly suggesting a level of uncertainty or ambivalence. Only a small proportion, 2.3%, hold a negative stance towards the incorporation of STEAM methods, possibly due to concerns or reservations. Significantly, there were no respondents who expressed "Strong Disagreement," highlighting the overall absence of strong opposition within this group of educators. The prevalence of backing and willingness from teachers to integrate STEAM methods into kindergarten pedagogy is highlighted by this data, indicating a wider inclination toward educational practices that recognise interdisciplinary and experiential learning in early childhood education.

(3) Perceptions related to the main benefits of implementing the STEAM-based Merdeka Curriculum in Kindergarten

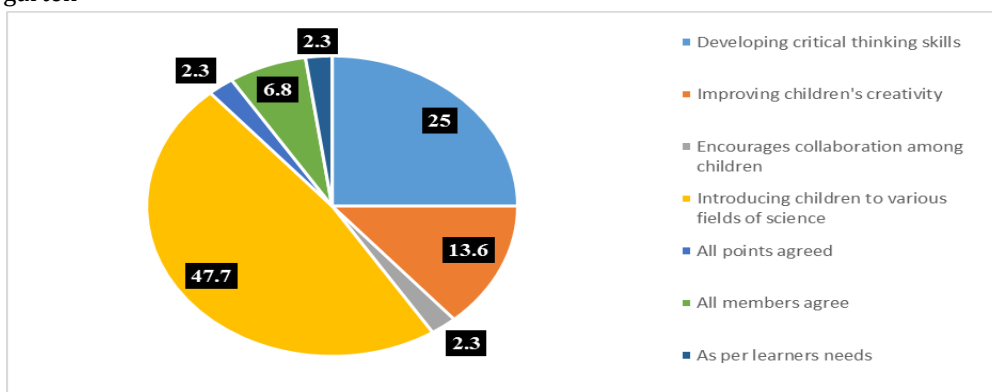


Diagram 3: Perceptions of the main benefits of implementing the STEAM-based Merdeka Curriculum in kindergarten

Through this data, we acquire an understanding of teachers' perceptions regarding the main benefits of introducing the STEAM-based Merdeka Curriculum in kindergarten environments. The findings highlight various advantages recognized by the respondents. The most significant benefit, with 47.7% agreement, is the

curriculum's potential to introduce young children to a wide range of scientific disciplines. This suggests that teachers recognise the curriculum's potential to broaden children's exposure to various STEM disciplines at an early age. Moreover, a significant 25% of respondents acknowledge its role in fostering critical thinking skills, emphasising its impact on cognitive development. In addition, 13.6% recognise its ability to enhance children's creativity, highlighting the value placed on nurturing creative capacities in early education. Although a smaller fraction (2.3%) acknowledges the promotion of collaboration among children, a notable percentage recognizes the curriculum's alignment with learners' needs (2.3%). This data highlights the perceived advantages of the STEAM-based Merdeka Curriculum, revealing its potential to promote interdisciplinary learning, critical thinking, and creative development within the context of early years education.

The findings reveal unique responses from 6.8% of participants who concurred with "All members agree," whilst 2.3% indicated "All points agreed." This may suggest a consensus or unanimous agreement regarding the benefits identified within their respective educational communities. It emphasizes the importance of collective agreement on the positive impact of the STEAM-based Merdeka Curriculum on children's development. Furthermore, the small minority of teachers who acknowledge that the syllabus is in line with the necessities of students emphasize the significance of adapting teaching methodologies to suit the distinct demands and abilities of children in their early years of schooling, henceforth.

(4) Perceptions related to the main obstacles or challenges in implementing the STEAM-based Merdeka Curriculum in kindergartens.

- Limited resources and equipment
- Lack of support from the school or institution
- Lack of training and understanding of the STEAM-based Merdeka curriculum
- Difficulty in integrating various STEAM elements in learning
- Limited tools and training on Merdeka curriculum
- Limited devices and more in-depth training on Merdeka curriculum

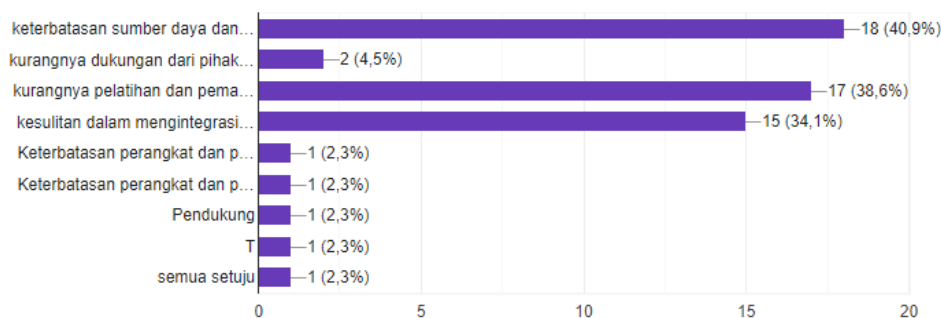


DIAGRAM 4. Perceptions related to the main obstacles or challenges in implementing the STEAM-based Merdeka Curriculum in Kindergarten.

4. Conclusion

Based on the diagram presenting the results of the above research, it can be inferred that most respondents hold a positive view regarding the implementation of the STEAM-based Merdeka Curriculum in kindergartens. The majority of respondents reported various benefits along with the main obstacles and challenges faced when implementing such a curriculum. The majority of teacher respondents indicated that the incorporation of the STEAM-based Merdeka Curriculum would yield substantial benefits in enabling integrative learning across different fields and fostering the development of advanced cognitive abilities such as collaboration, creativity, and critical thinking, in line with students' requirements. Likewise, most teachers surveyed reported that limited resources pose the biggest challenge in adopting the Merdeka curriculum, as evidenced by inadequate training

that hinders their comprehension and practical application of the STEAM-based Merdeka curriculum. Another significant challenge is teachers' difficulty in generating and integrating STEAM concepts, aligning them with the national curriculum, and meeting the contextual needs of students. In addition to other challenges, which are considered less significant in respondents' views, such as the lack of institutional or school support and the limitations of supportive devices, there are obstacles to implementing the STEAM-based Merdeka Curriculum in kindergarten.

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