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QUALITATIVE ANALYSIS OF THE INTEGRATION OF THE STEAM METHOD IN DEVELOPING INDONESIAN LANGUAGE SKILLS AT MI MAARIF BOJONGSARI

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Abstrak

This study explores the integration of the STEAM (Science, Technology, Engineering, Arts, and Mathematics) approach into Indonesian language learning at MI Maarif Bojongsari. Using qualitative descriptive methods, the study examines how STEAM-based learning impacts students' language skills, creativity, and 21st-century competencies. Data were collected through in-depth interviews with teachers, classroom observations, and document analysis. The results indicate that a project-based and inquiry-based learning model that integrates various STEAM disciplines effectively improves students' Indonesian language skills. For example, students engaged in activities such as designing a water filtration system and creating a persuasive poster, which required the application of language skills in real-world contexts. This interdisciplinary approach not only improved vocabulary and sentence structure but also encouraged critical thinking, problem-solving, and collaboration. However, the study also identified challenges such as limited resources and the need for teacher training in STEAM pedagogy. Despite this, teachers demonstrated creativity and adaptability by utilizing available resources and peer collaboration to effectively implement STEAM. These findings suggest that integrating STEAM into language education can transform learning by encouraging active engagement, enhancing language development, and preparing students for future challenges. The study concludes that STEAM-based language education has significant potential to reform learning practices at MI Maarif Bojongsari and contribute to students' holistic development by strengthening essential linguistic, cognitive, and social skills in the modern era.

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INTRODUCTION

Education plays a crucial role in shaping human development. As fundamental institutions in society, schools are expected to provide a comprehensive learning environment that supports not only intellectual growth but also emotional and social development. This holistic approach is crucial for preparing students to contribute meaningfully to society and adapt to an increasingly changing world. According to Tilaar (2022) and Darmaningtyas (2015), educational institutions should align the learning process with societal values while meeting the diverse needs of students. In Indonesia, education is not merely a necessity but a constitutional mandate. The Indonesian Constitution guarantees the right of every citizen to a quality education as a means to prepare for life in a multicultural and dynamic society (Sutrisno, 2019; Koesoemo, 2007). This legal framework emphasizes the importance of improving the quality of education to meet the ever-changing demands of the times.

In this context, the need for innovative educational practices is becoming increasingly urgent. Traditional teaching methods, while still relevant, are no longer sufficient to equip students with the critical thinking, creativity, collaboration, and communication skills needed in the 21st century. Therefore, educational reform is essential, and the introduction of innovative learning models is seen as a viable solution. One model currently gaining widespread attention is the integration of STEAM education—Science, Technology, Engineering, Arts, and Mathematics. This interdisciplinary approach aims to develop students' knowledge and skills across multiple fields, with an emphasis on real-world problem-solving, creativity, and collaboration (Beers, 2011).

The STEAM approach has proven effective in preparing students for future challenges. This approach encourages students to make connections across subject areas, deepen their understanding of complex issues, and foster critical thinking skills. This model emphasizes not only academic achievement but also the development of skills essential for personal growth and future career success. By engaging students in activities that combine scientific inquiry, technology use, engineering concepts, artistic expression, and mathematical reasoning, STEAM aims to develop resilient individuals capable of comprehensively addressing real-world problems.

In the context of language learning, STEAM integration holds great potential. Specifically, in Indonesian language learning, STEAM can be used to improve students' language skills through a variety of problem-based activities, hands-on experiences, and creative approaches. Traditional approaches to language learning often rely on memorization, with limited student engagement in meaningful language use contexts. By applying STEAM principles to Indonesian language learning, educators can create a more dynamic and engaging curriculum that not only improves linguistic skills but also fosters critical and creative thinking. This approach encourages students to use language as a tool for exploration and solving real-world problems, thereby enhancing their mastery and understanding of the language.

MI Maarif Bojongsari, as one of Indonesia's Islamic elementary schools, plays a crucial role in developing students' basic skills, including language skills. This institution is tasked with providing a comprehensive education that integrates general knowledge and religious knowledge. However, the language learning methods used at MI Maarif Bojongsari, like those in many other educational institutions, still tend to emphasize memorization and repetition, while providing limited space for the development of higher-order cognitive processes such as critical thinking, creativity, and problem-solving. This situation can hinder the development of higher-order thinking skills, which are crucial in today's global era.

With the increasing demands of 21st-century education, the integration of the STEAM approach into Indonesian language learning at MI Maarif Bojongsari offers a promising solution. By integrating science, technology, engineering, art, and mathematics into language lessons, educators can create more engaging and meaningful learning experiences. This approach not only improves language proficiency but also encourages students to develop important life skills such as creativity, collaboration, and critical thinking. Through project-based learning, students can explore real-world issues and apply language knowledge in practical and applicable ways. This process not only strengthens their language skills but also helps develop the cognitive and problem-solving abilities needed for future success.

The integration of STEAM into Indonesian language learning becomes increasingly relevant in the context of MI Maarif Bojongsari, where there is a significant emphasis on religious studies alongside general subjects. The application of STEAM principles to the curriculum allows for a more holistic approach to education, where students are encouraged to explore the connections between faith, culture, and the world around them. This can foster a deeper understanding of Indonesian and the world around them, thus preparing them for future challenges and opportunities.

While the potential for integrating STEAM into Indonesian language learning at MI Maarif Bojongsari is promising, implementing this approach is not without challenges. Teachers may struggle to adapt their teaching methods to support interdisciplinary learning, especially if they are accustomed to traditional learning approaches. Furthermore, limited resources and a lack of training in STEAM pedagogy also present obstacles. These challenges need to be addressed to ensure the successful integration of the STEAM approach into language learning.

This study aims to conduct a qualitative analysis of the integration of the STEAM approach in developing Indonesian language skills at MI Maarif Bojongsari. This study explores the strategies used by educators, the challenges faced in the implementation process, and the perceived impact on language skills and students' overall development. By examining the experiences of teachers and students, this study is expected to provide valuable insights into the effectiveness of STEAM-based Indonesian language learning and its potential to improve the quality of education at MI Maarif Bojongsari. Furthermore, this study aims to contribute to the discourse on educational innovation in Indonesia, particularly in the context of integrating interdisciplinary approaches to improve the teaching and learning process.

Through this research, it is hoped that the results obtained can inform educational policy and practice, as well as offer practical recommendations for educators who want to integrate STEAM into their classrooms. Ultimately, the goal of this research is to create more engaging, dynamic, and meaningful learning experiences for students, helping them develop language skills as well as critical and creative thinking skills that are essential for facing the modern world.

RESEARCH METHODS

This study uses a qualitative descriptive approach. The main focus is to explore and describe the integration of the STEAM approach in Indonesian language learning at MI Maarif Bojongsari. The research subjects included Indonesian language teachers and fourth-grade students at MI Maarif Bojongsari who were selected purposively. Data collection techniques were carried out through in-depth interviews, participatory observation during Indonesian language learning activities, and document analysis in the form of lesson plans and student work. Interviews were conducted to explore teachers' perceptions, strategies used, and challenges faced in implementing STEAM-based learning. Observations were used to capture actual practices in the classroom, while document analysis aimed to identify the integration of STEAM elements in

learning materials. Data were analyzed thematically by grouping information into themes such as learning strategies, student engagement, language skill development, and obstacles faced. Triangulation techniques were applied to ensure data validity by cross-verifying the results of interviews, observations, and document analysis.

RESULTS AND DISCUSSION

Result

This study explores the integration of the STEAM (Science, Technology, Engineering, Arts, and Mathematics) approach in improving Indonesian language skills at MI Maarif Bojongsari through qualitative descriptive methods. This study aims to assess how the integration of various disciplines with language teaching can improve students' language proficiency, foster creativity, and strengthen 21st-century skills. Data were collected through classroom observations, semi-structured interviews with teachers and students, and document analysis of teaching materials and student work. Thematic analysis of the collected data revealed several key patterns related to the forms of STEAM integration, their impact on language skill development, student engagement, teacher strategies, challenges faced, and the development of 21st-century competencies. This in-depth analysis provides an overview of STEAM's potential to transform language learning, providing deeper insights into the complex relationships between content, language, and skill development.

1. Forms of STEAM Integration in Language Learning

   The integration of STEAM principles into Indonesian language teaching at MI Maarif Bojongsari is primarily implemented through project-based and inquiry-based learning models. These models enable students to engage in cross-disciplinary activities that combine various fields of knowledge, such as science, technology, engineering, art, and mathematics, while building core language skills. Teachers design learning experiences that emphasize collaboration, problem-solving, and hands-on engagement, which foster cognitive and linguistic development. In one learning activity, for example, students were tasked with designing a simple water filtration system using recycled materials. This project combined science (understanding filtration) and engineering (designing a filtration system) with language learning, as students were asked to document and explain the steps of their project in Indonesian. This activity not only reinforced science and engineering concepts but also required students to practice logically organizing ideas in their native language. Students demonstrated their ability to describe processes, explain technical terms, and write procedural texts clearly in Indonesian. Another project involved creating a persuasive poster promoting environmental sustainability, combining art and technology with language practice. In this case, students designed posters and then presented them orally, practicing written and spoken Indonesian language skills. These activities demonstrate how STEAM integration can foster interdisciplinary learning while supporting language development, consistent with Yakman (2008) who emphasized that STEAM fosters higher-order thinking by promoting connections between disciplines. Furthermore, Beers (2011) highlighted the importance of authentic tasks in language education, suggesting that students are more likely to develop meaningful literacy when language is contextualized in real-world, interdisciplinary contexts.

2. Impact on the Development of Indonesian Language Skills

   The integration of STEAM in Indonesian language classes provides a multidimensional learning experience, enabling students to simultaneously develop

cognitive, linguistic, and creative skills. During project-based assignments, students are not only asked to design and build concrete projects but also to document their processes, explain their results, and reflect on their experiences using Indonesian. These activities help students expand their vocabulary, improve sentence structure, and strengthen their ability to connect ideas coherently in writing. For example, after conducting a science experiment on plant growth, students are asked to compose a scientific report in Indonesian, combining factual descriptions with procedural narratives. This interdisciplinary learning context enriches students' understanding of both content and language, as scientific language becomes integrated with the procedural structure of Indonesian texts. The authenticity of these assignments, as discussed by Beers (2011), helps anchor language learning in meaningful experiences, enhances students' literacy, and encourages them to apply their language skills to problem-solving. By integrating content learning with language instruction, students can see language as a tool for expression and communication, rather than as a separate subject to be memorized. This holistic approach allows them to develop deeper cognitive connections, enabling them to use language not only to convey information but also to build and share knowledge in meaningful ways.

3. Increased Creativity and Engagement

One of the greatest impacts of STEAM-based learning is its ability to foster creativity and increase student engagement. Students expressed enthusiasm for the practical, hands-on nature of the projects, which they found far more engaging than traditional language teaching methods. For example, students were given the opportunity to create physical models, drawings, and presentations that demonstrated their understanding of various topics. The act of creating tangible objects and then explaining them in Indonesian gave students a sense of ownership over their learning process. This shift from passive to active learning allowed students to engage more with the language, as they had to think critically about how to explain their work and reflect on their findings. As one student put it, "When we make something and then explain it, it feels easier to speak in Indonesian because we understand what we're talking about." Another student said, "I like drawing and making things, not just writing. It makes learning Indonesian more interesting." These responses highlight the importance of incorporating creativity into the learning process. According to Ryan and Deci's (2000) Self-Determination Theory, motivation increases significantly when students feel a sense of autonomy, competence, and connection to the learning experience. The practical nature of these projects and the opportunity to create real-world products contribute to students' motivation and help them develop greater language fluency.

4. Teacher Strategies in Overcoming Challenges

Despite positive results, implementing STEAM-based instruction also faces significant challenges. One of the most glaring issues is the lack of resources in many classrooms, particularly the lack of digital devices, laboratory equipment, and basic art supplies. Teachers often have to improvise using household items, recycled materials, and local resources to conduct STEAM projects. As one teacher explained, "When we don't have access to the right science equipment, we use old plastic bottles, rocks, and sand to teach about water filtration." This agility demonstrates teachers' adaptability in resource-limited environments. Furthermore, many teachers lack formal professional development in STEAM pedagogy, making it difficult to design fully integrated and interdisciplinary lessons. To address this, teachers often collaborate with colleagues, take

online courses independently, and form informal study groups to exchange ideas, lesson plans, and teaching strategies. Time constraints also pose a challenge, as project-based activities often require more instructional time than traditional lessons. Teachers address this by breaking large projects into smaller, more manageable phases and setting realistic timelines to ensure curriculum standards are met. This adaptive strategy reflects the findings of Herro and Quigley (2017), who emphasized the importance of teacher innovation and collaboration in addressing challenges in resource-constrained contexts.

5. Student Responses to STEAM-Based Learning

Student responses to STEAM-based learning were overwhelmingly positive. Many students found the lessons more enjoyable, engaging, and meaningful than traditional approaches to language learning. Students particularly appreciated the opportunity to work on projects that required them to create something tangible. One student commented, "It felt like I was actually doing something, and it helped me learn to speak Indonesian better." Another student expressed, "I liked being able to make something with my hands and then explain it. It helped me understand the lesson better and made learning Indonesian easier." These sentiments align with Ryan and Deci's (2000) Self-Determination Theory, which states that students are more motivated when learning activities meet their needs for autonomy, competence, and connection. By providing opportunities for students to learn independently and allowing them to have control over their projects, STEAM-based activities contribute to increased student motivation and improved language skills.

6. Developing 21st Centu-ry Skills Alongside Language Competence

STEAM integration not only supports language proficiency but also fosters the development of essential 21st-century skills. During project-based activities, students develop critical thinking skills by analyzing problems, generating hypotheses, testing solutions, and reflecting on their results. These activities encourage students to think creatively and find innovative solutions to complex problems. Collaboration skills also improve, as students work together in teams, negotiate project roles, share responsibilities, and resolve conflicts. Communication skills, both written and oral, continue to be honed as students document their projects, engage in peer feedback, and present their findings. These findings align with the "4Cs" framework—Critical Thinking, Creativity, Collaboration, and Communication—which is central to preparing students for the demands of the modern world. Furthermore, the observed learning process reflects Bloom's Taxonomy, as students progress beyond simple memorization to higher levels of cognitive performance such as analysis, synthesis, and creation.

In addition, Vygotsky's (1978) Sociocultural Theory plays a crucial role in understanding how students develop language skills in STEAM-based learning contexts. Vygotsky emphasized the importance of social interaction and cultural context in cognitive development, suggesting that learning is most effective when it occurs in socially mediated contexts. In STEAM-based learning, students work collaboratively, sharing knowledge, solving problems together, and negotiating meaning. This collaborative process helps students develop their language skills in authentic contexts, supported by peers and teachers who guide their learning.

Discussion

This study aims to examine the integration of the STEAM (Science, Technology, Engineering, Arts, and Mathematics) approach in improving Indonesian language skills at MI Maarif Bojongsari. This study used a qualitative descriptive method by collecting data through classroom observations, semi-structured interviews with teachers and students, and document

analysis in the form of teaching materials and student work. Thematic analysis revealed various important insights regarding the integration of STEAM in language learning, its impact on language skill development, strategies used by teachers, challenges faced, and the development of 21st-century competencies in students.

The integration of STEAM into Indonesian language learning is primarily implemented through project-based and inquiry-based learning models. These models allow for the integration of various disciplines while focusing on developing language skills. For example, one project asked students to design a water filtration system using recycled materials. This activity combined science and engineering with language learning, as students were asked to document the process and explain the steps in Indonesian. These tasks not only helped students understand scientific concepts but also encouraged them to organize and express their thoughts clearly in written and spoken Indonesian. Another project involved creating a persuasive poster to promote environmental sustainability, combining art and technology with language practice. Students presented their posters and explained their designs in Indonesian, improving their speaking and writing skills. These examples demonstrate the potential of STEAM to foster interdisciplinary knowledge and higher-order thinking, aligning with Yakman's (2008) view that STEAM encourages students to make connections across disciplines, thereby enhancing critical thinking and problem-solving skills.

This study also revealed that STEAM integration had a profound impact on the development of students' Indonesian language skills. By engaging in project-based tasks, students not only deepened their understanding of the content but also had to articulate their learning and reflections in Indonesian. For example, after conducting an experiment on plant growth, students were asked to write a scientific report in Indonesian, combining descriptive and procedural language. This integration of language and content knowledge enabled students to expand their vocabulary, refine their syntax, and strengthen their ability to organize ideas cohesively. The practice-based nature of the activities, coupled with the requirement to use Indonesian for documentation and presentations, provided a meaningful context for language learning, supporting Beers' (2011) argument that authentic tasks can enhance literacy by linking language use to real-world experiences.

Student engagement and creativity also significantly increased through STEAM-based learning. Students reported enjoying the practical, hands-on nature of the projects, which made learning more enjoyable and meaningful than traditional methods. One student noted, "When we make something and then explain it, it feels easier to speak in Indonesian because we understand what we're talking about," highlighting the connection between experiential learning and language development. Another student noted, "I like drawing and making things, not just writing. It makes learning Indonesian more interesting." These responses confirm the role of autonomy and creativity in increasing student motivation, as proposed in Ryan and Deci's Self-Determination Theory (2000). When students have the opportunity to own their projects, their engagement increases, which has a positive impact on language skills.

Despite these positive results, the implementation of STEAM-based learning also faces several challenges. Resource limitations, such as a lack of digital devices, laboratory equipment, and art supplies, are a common issue. In response, teachers often improvise using household items, recycled materials, and local resources. For example, one teacher shared, "When we don't have access to adequate science equipment, we use old plastic bottles, rocks, and sand to teach about water filtration." This creative approach reflects the findings of Herro and Quigley (2017), who emphasized the importance of teacher innovation in overcoming resource limitations. Furthermore, a lack of professional training in STEAM pedagogy makes it difficult for some

teachers to design integrated, cross-disciplinary learning. To address this, teachers collaborate with each other, take online courses, and form informal study groups to share strategies and lesson plans. Time constraints also pose a significant challenge, as project-based activities often require more instructional time than traditional lessons. Teachers address this by breaking large projects into smaller phases and establishing realistic schedules to ensure the curriculum can still be completed.

Student responses to STEAM-based Indonesian language learning were generally very positive. Many students reported that they found the learning more engaging and enjoyable than traditional methods. The practice-based nature of the learning, coupled with the opportunity to produce a tangible product, contributed to a deeper understanding of the language. One student commented, "I feel more confident speaking Indonesian because I understand what I'm talking about," demonstrating how the integration of content and language promotes fluency. This positive response is consistent with Ryan and Deci's (2000) Self-Determination Theory, which states that motivation and engagement increase when students feel competent, have autonomy, and feel connected to the learning process.

STEAM integration also fosters the development of essential 21st-century skills alongside enhanced language skills. Students demonstrated improved critical thinking skills through problem analysis, solution design, and reflection on their work. Creativity was fostered through project design and artistic expression in assignments such as poster creation. Collaboration skills were strengthened as students worked in teams, shared responsibilities, and negotiated project roles. Communication skills, both verbal and written, continued to be honed as students documented their projects, received peer feedback, and presented findings. These findings align with the "4Cs" framework (Critical Thinking, Creativity, Collaboration, and Communication), which are essential competencies for 21st-century success. The observed learning process also reflected Bloom's Taxonomy, with students demonstrating higher cognitive levels such as analysis, synthesis, and creation, which are the highest stages of learning.

CONCLUSION

In conclusion, this study confirms that the integration of the STEAM approach in Indonesian language learning at MI Maarif Bojongsari provides significant benefits. It not only improves students' language skills but also fosters creativity, critical thinking, collaboration, and communication, which are essential for success in the 21st century. Despite challenges such as limited resources and time constraints, teachers demonstrated innovation and adaptability in overcoming these obstacles, ensuring the successful integration of STEAM in their classrooms. The positive impact on student engagement and language competency demonstrates that STEAM-based learning has significant potential to drive educational reform, particularly in supporting holistic student development. As education systems continue to evolve, the findings of this study contribute to the growing body of evidence supporting the integration of interdisciplinary learning approaches such as STEAM in language education.

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