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Integration of Scouting Methods and Islamic Arts: Realizing the Student Profile of Pancasila Through Geometry Learning

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Abstract

This study addresses the challenges of teaching geometry in Indonesian secondary schools by developing innovative instructional materials that integrate Islamic Art and scouting methods. This research adopts an Educational Design Research approach, focusing on the final assessment phase to develop and test geometry learning tools in junior high schools. These tools include modules, teaching materials, and student worksheets that incorporate Islamic Art from local mosques in Kendari City and employ the scouting method, which emphasizes experiential learning and group collaboration. The study demonstrates that integrating Islamic Art and scouting methods enhances students' competencies in alignment with the Profil Pelajar Pancasila (P3) program, which aims to develop character traits such as faith, global diversity, independence, cooperation, critical thinking, and creativity. Field testing in two schools showed that students using these materials achieved high average scores across all P3 indicators, affirming the approach's effectiveness. This research highlights the potential of context-based, culturally relevant instructional materials to improve geometry education and foster essential character traits in students. Future studies should further explore broader applications of these methods to validate their effectiveness in diverse educational settings.

Keywords: geometry learning; islamic art; scouting method; students' pancasila profile; teaching material.

INTRODUCTION

At the secondary school level, teachers and students often feel overwhelmed by the teaching and learning process, particularly in mathematics education (Hutagaol, 2021; Mustakim, 2020). Geometry is one of the most challenging topics for students due to its complexity (Kusumawati et al., 2021). National exam results for junior high schools from 2015-2019 indicate that geometry and measurement have the lowest proportion of correct answers among mathematics topics, achieving only 42.27% (Balitbang Kemdikbud RI, 2019). This result highlights a crucial need for innovative instructional materials in geometry learning.

In the context of the Merdeka Curriculum, i.e., the curriculum used by the educational system in Indonesia, which promotes active curriculum development by teachers, there is significant freedom and responsibility to create engaging and effective teaching materials (Malikah et al., 2022). However, this flexibility also demands high levels of creativity and innovation from educators. Traditionally, teachers have taught geometry using drawings on the blackboard and explaining examples from daily life. Therefore, there is a pressing need for instructional materials that support teachers and students in understanding geometry (La Hadi et al., 2022).

Developing instructional materials is common in mathematics education, encompassing modules, lesson plans (RPP), worksheets (LKPD), and teaching materials (Fahrurrozi et al., 2020; Kurniati, 2018; Yuniati, 2018; Yustinaningrum, 2017). Instructional materials based on Islamic values have proven valid and effective for learning mathematics concepts (Fahrurrozi

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et al., 2020; Kurniati, 2018). According to (Yuniati, 2018) also found that the appropriate use of Islamic context in instructional materials can improve students' mathematics learning outcomes. (Fahrurrozi et al., 2020) used the contexts of faith, worship, and morality values in teaching integer and fraction materials. According to (Kurniati, 2018) developed a module for linear equations by revealing mathematical concepts in the Qur'an and Hadith.

Based on the research presented, developing Islamic-based instructional materials is highly recommended for mathematics education. Geometry teaching also uses context-based materials to enhance students' understanding. For example, (Yustinaningrum, 2017) used the context of Kerawang Gayo to study geometric shapes. However, no materials have been developed using the context of Islam, such as Islamic Art, even though this art form is ubiquitous in mosques throughout Indonesia and is familiar to students. Islamic Art can contextualise geometry elements through direct construction and real-world discovery, known as horizontal mathematization (Karadag, 2018). This study focuses on integrating Islamic Art from mosque architecture in Kendari City, Southeast Sulawesi, specifically from landmarks such as the Al-Kautsar Grand Mosque and Al Alam Mosque.

To align with the Profil Pelajar Pancasila (P3) - a program by Indonesia's Ministry of Education aimed at character-building based on Pancasila principles—current geometry teaching must develop competencies such as belief in God Almighty, global diversity, cooperation, independence, critical thinking, and creativity (Kemdikbud, 2022). Traditional geometry teaching methods have not fully achieved these competencies. To study the geometric concepts in the design of these mosques, students need to learn in groups directly in an open environment (the mosque surroundings) while adhering to societal norms. This condition can be achieved through learning that applies the scouting method, which has not been previously done in mathematics education.

The scouting method, proven to enhance the P3 competencies (Amaliyah, 2022; Bukhori et al., 2023; Romadhon et al., 2022), offers a promising approach. Practising the code of honour as part of the method can help students develop various positive characteristics relevant to P3 (Irfandi et al., 2021; Nailiyah et al., 2018). This research aims to fill the gap in the current instructional materials by integrating the scouting method and Islamic Art into geometry learning. By incorporating these elements, we strive to develop instructional materials that are innovative, contextual, and effective in supporting the achievement of the P3 competencies.

METHODS

This research is part of the educational design research stage with a research and development approach (Research & Development). Educational design research with an R&D approach is the systematic analysis, design, and evaluation of educational interventions to produce research-based solutions to complex problems in academic practice and advancing knowledge about the characteristics of these interventions (Plomp & others, 2013). The intervention referred to in this research is a geometry learning tool based on scouting methods, Geogebra, and Islamic Art. The learning device component consists of three main parts: teaching modules, teaching materials, and LKPD or student worksheets (Kemendikbud, 2022). The development of this learning tool will adopt Plomp's model. Based on the model, this research is divided into three main stages: preliminary research, prototyping phase, and assessment phase (Plomp & others, 2013). This article only discusses the third stage.

This research concerns learning tools for geometry content in junior high schools. The learning tools have been developed and tested in two schools, SMPN 5 Kendari and MTsN 1 Konawe Selatan, to see their effectiveness in realizing P3 for students. After the students were given and practised the instruction materials, they took an assessment to measure their P3. Every component of P3 has four indicators. The assessment indicators are shown below.

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Table 1. P3 Assessment Indicators

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P3 Component	Assessment Indicators
Believing, Pious, and Noble (PP1)	 Pray fervently before learning begins Be polite and friendly towards others Accustomed to giving appreciation for other people's achievements Understand and respect the feelings and points of view of other people and/or groups
Global Diversity (PP2)	 Want to know and appreciate culture Able to know and appreciate culture Have intercultural communication skills in interacting with others Having reflection and responsibility for the experience of diversity
Independent (PP3)	 Need encouragement to want to do the task Want to do the job Able to do the task Able to do tasks independently and correctly
Cooperation (PP4)	 Want to gather in one group Participate in contributing ideas to the group I want to advise if there are shortcomings Willing to work together with friends in the same group
Critical Reasoning (PP5)	 Have curiosity Ask questions according to context Provide appropriate solutions according to the context Produce the right arguments
Creative (PP6)	 Spark lots of ideas, answers, and suggestions for solving problems Can apply concepts, properties, or rules in problem-solving examples Spark problems, ideas or things that other people have not thought of Develop or enrich other people's ideas

With, score 4: when meeting four indicators; score 3: when only three indicators are met; score 2: when only two indicators are met; score 1: when only one indicator is met.

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RESULTS AND DISCUSSION

❖ Islamic Art and Geometry

Geometry is a mathematical topic that has extensive transdisciplinary applications. Especially in the Islamic world, geometry is evident in constructing mosques (Islamic architecture) and Islamic Art, which is developing in various parts of the world (Ettinghausen et al., 2003). According to (Karadag, 2018) suggests that "Islamic Art used to denote artefacts created and influenced by Islamic culture." Creating Islamic Art can assist students in performing horizontal mathematization of geometric concepts. This approach is crucial for enhancing students' comprehension of the ideas associated with the material (Barnes, 2004; Makonye, 2014).

Islamic Art is used to denote artefacts made and influenced by Islamic traditions. The common aspect of these artefacts is the spirituality they impart. Each tradition develops its spirituality, and artefacts under the influence of this tradition may reflect its own religious and ethnic perspective. Islamic Art is usually described as a phenomenon independent of time, race, language, and geography, but it integrates all these factors (Ettinghausen et al., 2003). Islamic Art is aniconic Art because Islamic tradition holds that nothing in the physical world can accurately represent the "world above" (e.g. heaven). However, people have always tended to interpret God's words and apply their interpretations in their work.

For example, an eight-pointed star-a familiar figure used in Islamic Art-also called the star of Islam may appear in surah Al-Haqqah verse 8 in the Al-Qur'an: "And the angels are in the corners of the sky. Furthermore, on that day, eight angels held up the Throne of your Lord above--their heads (Translated by the Ministry of Religious Affairs Republic of Indonesia, 1990). Some Islamic art constructions start with four sides at the bottom and continue or end with eight walls on the next floor, depicting the journey from earth to heaven, which can be interpreted as life. Such an interpretation may lead us to assume Islamic Art is a synthesis and joint development of Art and Sufism from divine Art created by God or allowed by Him to be created by humans (Karadag, 2018).

Geometry Exploration in Islamic Art enables mathematics educators to take advantage of the existence of this artefact to help students engage in learning and doing mathematics. We can find almost all Geometric shapes in Islamic art shapes, such as points, lines, planes, flat figures, the concept of similarity, and the concept of similarity. Geometry finds a place to connect divine and cultural factors and other factors such as race, language, and geography by creating a balance between them (Karadag, 2018). Spiritual life must begin with submission. Islamic tradition teaches that without submission, there can be no proper understanding; without discipline, there will be no flow of spirit that leads to actual and essential knowledge. This relation is most visible in the relationship between fundamental Islamic art aspects, namely geometry, Islam and calligraphy. Deep geometry Islamic Art is the objective manifestation of the principles of creation and forms the basic framework for visual expression that leads from unity to multiplicity (Azzam, 2013). Some examples of Islamic Art have appeared in the interiors of mosques in Southeast Sulawesi, including the happy and tenfold form found at the Al-Alam mosque in Kendari.

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Figure 1. Islamic Art at I'timad-ud-Daulah, Agra, India



Figure 2. Islamic stars at the Mosque and Topkapi Palace, Türkiye



Figure 3. Islamic Stars at Mosques in Kendari City (Al-Alam Mosque and Al Kautsar Mosque)

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Scouting Method in Learning Geometry

Scouting methods are processes and ways to uphold the fundamental values and principles of Scouting. Each component of the Scouting Method has a specific educational function that strengthens and supports each other in achieving Scouting educational goals (ART Scout Movement, 2018). The scouting method has eight forms based on the Bylaws (ART) of the Scout Movement (article 10, paragraph 2). This research only uses 6 (six) of the eight methods. The following describes each method used (Pramuka, 2005) and its use in Geometry learning tools.

1. Implementation of the Scout Code of Honor

The Scout Code of Honor is implemented in the form of Worshiping according to one's religious beliefs and beliefs; Building togetherness and caring, both in the family environment and school life; Listening, respecting, and accepting other people's opinions or ideas; controlling oneself, being open, obeying agreements and paying attention to shared interests, prioritizing unity and integrity and speaking and behaving politely, friendly and patient; Accepting assignments sincerely, as an effort to personally prepare for the future, trying to train skills and knowledge according to ability, being cheerful in carrying out tasks and facing difficulties and challenges; Controlling oneself in facing challenges and reality bravely and faithfully; Comply with norms and rules; Keep promises, be responsible for actions and deeds; and Have good thinking and reasoning power when planning activities and when carrying out activities, as well as being careful in acting, behaving and speaking. This practice will be realized from the P3 that will be achieved through learning: having faith, being devoted to God Almighty, and having noble character, global diversity; working together; independent; critical and creative reasoning.

2. Learning By Doing

Learning by doing is carried out by prioritizing as many practical activities as possible in each geometry lesson, such as skills using GeoGebra and sharing valuable experiences. In addition, this act also directs students to always do real things, in this case, studying geometry found in Islamic Art, motivating their curiosity about geometric concepts, and encouraging them to participate in all activities actively

3. Group Activities, Collaboration, and Competition

The first principle of group activities is that students are grouped in movement units led by the students. Second, group activities provide learning opportunities to lead, manage, be governed, organize, assume responsibility, and work and collaborate harmoniously.

4. Interesting and challenging activities

Interesting and challenging activities are creative, innovative, recreational, and educational. They can change attitudes and behaviour, increase knowledge and experience, and improve life skills. In Geometry learning, students will be invited to construct Islamic Art with the GeoGebra application. After that, each group displayed their best work and explained the Geometry concepts used in Islamic Art

5. Outdoor Activities

Outdoor activities are educational, recreational activities that prioritize health, safety, and security. It also provides an experience of the interdependence between natural elements and the need to preserve them and develops a responsible attitude toward the future of natural balance. When studying geometric concepts in Islamic Art, students took to study directly in the mosque environment in Kendari city

6. The presence of adults who provide guidance, encouragement, and support

The presence of adults in every activity is multifaceted, serving as planners, organizers, controllers, supervisors, and assessors. They also act as consultants and motivators for students, guiding them through their activities. Additionally, adults fulfil roles as tutors, trainers, instructors, companions, and protectors, ensuring students are supported and safe. Ultimately,

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they are responsible for the overall implementation of student activities. This method strengthens the teacher's position as a facilitator in learning Geometry. Apart from that, the teacher's presence in every student activity also ensures the achievement of the planned P3

❖ How Could Integrating Scouting Methods And Islamic Art Through Geometry Learning Be Effective in Enhancing P3?

Mathematics plays a vital role in implementing the independent curriculum. In this context, mathematics is a subject taught to students and a tool for developing critical thinking, logic, and problem-solving skills. One of the goals of the Merdeka Curriculum is to produce graduates who can think critically and creatively. Through learning mathematics, students are taught to analyze problems, look for patterns, and make generalizations. This process involves logical and critical thinking skills, which are crucial in everyday life and the workplace.

The implementation of the Independent Curriculum can use mathematics as a tool to develop 21st-century skills. Mathematics involves the use of technology and digital tools in problem-solving. Students are taught to use mathematics, spreadsheets, and computer graphics software to visualize and analyze data. This ability is invaluable in a world of work increasingly dominated by technology. One of the estuaries of developing these abilities is the realization of P3 in each student.

P3 has six main profiles: faith, devotion to God Almighty, noble character, global development, independence, cooperation, critical reasoning, and creativity. As emphasized in the previous paragraph, these last two profiles can be achieved through learning mathematics. However, research has shown that the other four profiles can be achieved if mathematics learning modules focus on strengthening P3 (Kusmayanti et al., 2023; Setiawan et al., 2022). In this research, it has been found that integrating scouting methods and Islamic Art in mathematics learning tools (consisting of teaching modules, teaching materials, and LKPD) can create students with the expected Pancasila profile.

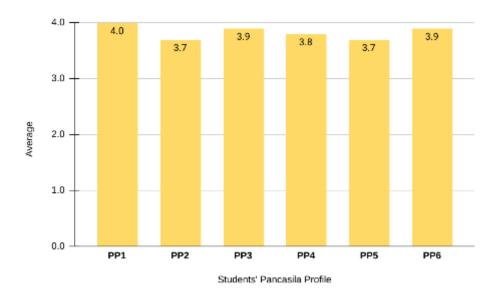


Figure 4. The average value of students' score on each Pancasila profile components.

Based on the results obtained in Figure 4, it is illustrated that the profile "Being faithful, devoted to God Almighty, and having noble character" received the highest average. This result reflects the application of the scouting method "Practicing the Scout Code of Honor" which is

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oriented towards achieving the basic principles of Scouting. Dasa Darma Pramuka contains character education values, including religious values, tolerance, honesty, discipline, hard work, creativity, independence, democracy, curiosity, national spirit, love of the homeland, respect for achievement, friendly/communicative, love of peace, likes reading, cares about the environment, social values, and responsibility (Zakaria, 2014). Furthermore, the "Independent" and "Creative" profiles occupy second place with an average score of 3.9. This achievement is the result of applying the scouting methods "Learning by doing", "Group Activities, Collaboration and Competition", and "Interesting and challenging activities". These three methods are applied to learning activities that ask students to identify the elements of Geometry in Islamic Art. This finding aligns with (Amaliyah, 2022), who found that using scouting methods in learning can increase students' P3.

The "Global diversity" and "Cooperation" profiles also received good average scores. These results are supported by applying the scouting methods "Practicing the Scout Code of Honor" and "Group Activities, Collaboration, and Competition". Student activities that integrate this method require students to collaborate positively by upholding the principles of democracy and mutual respect between group members. (Perwira & Suryani, 2022) found a similar thing in applying scouting methods through actualization activities of EWPK (Ekstrakrukuler Wajib Pendidikan Kepramukaan). The results of their research found that this method can improve students' skills in working in groups and foster mutual respect.

The outdoor activities provided by the scouting method stimulate students to think critically about phenomena around them. Students can explore Islamic Art in surrounding mosques to observe related geometric concepts. The process they go through supports achieving the "Critical Reasoning" profile. Implementing all learning activities outlined in the learning tools can only be optimally achieved with the teacher's role as a facilitator. So far, school learning activities, especially in mathematics lessons, have not been optimal because teachers cannot position themselves as facilitators (Lukman et al., 2022). This role is significant in supporting student-centered learning. The emphasis on applying the scouting method "Presence of Adults Who Provide Guidance, Encouragement and Support" in the tools developed requires the teacher to play the facilitator position to the maximum. In every student activity, independently and in groups, the teacher will be present to control and observe every activity. This method ultimately supports the optimal achievement of the six expected P3s.

Based on the results from Graph 1, the average student score for each P3 is in an outstanding category. This finding aligns with Kusmayanti et al. (2023), who concluded that developing mathematics teaching modules focusing on strengthening profiles effectively realizes P3. More specifically, (Setiawan et al., 2022) found that Geometry learning tools effectively grew the Pancasila profile in students. This research obtained these results using scouting methods, Islamic Art contexts, and GeoGebra applications in every student learning activity.

CONCLUSION

Geometry learning tools that combine the scouting and Islamic Art methods have proven effective in forming P3. The evaluation results show that students achieved high average scores on all profile indicators, indicating the success of this learning tool in supporting the expected competencies. Overall, the researchers suggest further research into the effectiveness of using this learning tool in realizing P3.

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