

Research Article

Integrating Halal Literacy Through Problem-Based Learning In Science Education In Junior High Schools

Risa Falihahtul Janah¹, Neneng Windayani², Sumiyati Sa'adah³, Tri Cahyanto⁴

Universitas Islam Negeri Sunan Gunung Djati Bandung, Bandung, Indonesia

Corresponding Author, Email: risafalihahtul@gmail.com (Risa Falihahtul Janah) 



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Abstract. The integration of halal literacy into science education is an effort to develop students' understanding of the concept of halal through contextual learning. This study aims to describe the implementation of halal literacy integration through Problem-Based Learning (PBL) in science education at junior high schools. This study employed a descriptive qualitative approach with science teachers and students at a junior high school as the subjects. Data were collected through interviews and Student Worksheets (LKPD), then analyzed using the interactive analysis model developed by Miles, Huberman, and Saldaña. The results of the study indicate that the implementation of halal literacy integration through Problem-Based Learning provides a contextual learning experience, enabling students to connect science concepts with the halal aspects of food products in the school environment. Based on the eight indicators of halal literacy, students were able to understand the concepts of halal and haram, identify product ingredients, relate halal concepts to daily life, and utilize

information on packaging labels to analyze the halal status of products. However, students still need further support in analyzing food additives and production processes. Thus, the integration of halal literacy through Problem-Based Learning can serve as an alternative approach to science education to support the contextual development of students' halal literacy.

Keywords: Halal Literacy, Problem-Based Learning, Science Education.

Abstrak. Integrasi literasi halal dalam pembelajaran IPA merupakan upaya untuk mengembangkan pemahaman peserta didik mengenai konsep halal melalui pembelajaran yang kontekstual. Penelitian ini bertujuan mendeskripsikan implementasi integrasi literasi halal melalui Problem-Based Learning (PBL) dalam pembelajaran IPA di Sekolah Menengah Pertama. Penelitian ini menggunakan pendekatan kualitatif deskriptif dengan subjek guru IPA dan peserta didik di salah satu Sekolah Menengah Pertama. Data dikumpulkan melalui wawancara dan Lembar Kerja Peserta Didik (LKPD), kemudian dianalisis menggunakan model analisis interaktif Miles, Huberman, dan Saldaña. Hasil penelitian menunjukkan bahwa implementasi integrasi literasi halal melalui Problem-Based Learning memberikan pengalaman belajar yang kontekstual sehingga peserta didik mampu menghubungkan konsep IPA dengan aspek kehalalan produk makanan di lingkungan sekolah. Berdasarkan delapan indikator literasi halal, peserta didik mampu memahami konsep halal dan haram, mengidentifikasi bahan penyusun produk, mengaitkan konsep halal dengan kehidupan sehari-hari, serta memanfaatkan informasi pada label kemasan dalam menganalisis kehalalan produk. Namun, peserta didik masih memerlukan penguatan dalam menganalisis bahan tambahan pangan dan proses produksi. Dengan demikian, integrasi literasi halal melalui Problem-Based Learning dapat menjadi alternatif pembelajaran IPA untuk mendukung pengembangan literasi halal peserta didik secara kontekstual.

Kata Kunci: Literasi Halal, Problem-Based Learning, Pembelajaran IPA

INTRODUCTION

21st-century learning requires educators not only to be able to teach and manage classroom activities effectively, but also to build positive relationships with students and the school community. In addition, educators are expected to utilize technology to support the learning process and to engage in ongoing reflection (Wuarlela et al., 2022). One approach that can be used to address these challenges is the Problem-Based Learning (PBL) model, which is considered effective. Problem-Based Learning is a learning model that centers the learning process on students by presenting complex real-world problems to be actively solved through exploration, collaboration, and reflection. Through the implementation of PBL, students are encouraged to develop higher-order thinking skills, including the ability to analyze, evaluate, and synthesize information, as well as to improve social skills such as communication, collaboration, and responsibility in the learning process (Vedira et al., 2024). This model is in line with 21st-century educational goals, which emphasize the development of critical thinking, creativity, collaboration, and communication skills (Haryanti, 2017; Yuli et al., 2020). In science education, Problem-Based Learning is a particularly relevant model because the nature of science emphasizes the scientific inquiry process, problem-solving, and the development of higher-order thinking skills. Through the presentation of contextual problems, students not only gain conceptual understanding but are also able to connect scientific concepts to phenomena that occur in everyday life.

Various studies have reported that the implementation of Problem-Based

Learning (PBL) has a positive impact on increasing student engagement, deepening conceptual understanding, enhancing motivation to learn, and improving critical thinking and problem-solving skills (Elya, 2025). Various studies have also shown that the implementation of Problem-Based Learning can improve students' science learning outcomes, critical thinking skills, problem-solving skills, and collaboration skills. Furthermore, PBL increases students' active engagement during the learning process because it focuses on solving contextual problems that are closely related to everyday life. However, despite these advantages, the implementation of PBL still faces various challenges, including those related to teacher readiness, student characteristics, and limitations in learning resources and time. (Dole, S., Bloom, L., & Kowalske, 2015) The implementation of Problem-Based Learning (PBL) requires teachers to be prepared to design contextual problems that stimulate students' thinking processes, manage group interactions effectively, and provide appropriate facilitation throughout the learning process. In addition, students accustomed to a teacher-centered learning approach often face challenges in adapting to the characteristics of PBL, which emphasizes independent, collaborative, and problem-solving-oriented learning.

In the context of science education, the implementation of Problem-Based Learning (Khairunnisa, Miftahul Husna Zain, 2025) becomes increasingly relevant when integrated with the development of halal literacy. Halal literacy is not only understood as an understanding of the concepts of halal and haram based on Islamic law, but also encompasses students' ability to access, understand, analyze, evaluate, and use information related to the halal status of a product or process in a critical and responsible manner (Nurdin et al., 2024). Integrating halal literacy into science education provides students with the opportunity to connect scientific concepts to real-world issues encountered in daily life, such as the fermentation process, the use of food additives, biotechnology, cosmetics, pharmaceuticals, and other consumer products (Ayyub, M., Rana, S., & Naz, 2015). Through problem-based learning, students are encouraged to investigate scientific aspects while also considering halal considerations in the decision-making process, thereby developing critical thinking skills, responsible decision-making, and awareness as informed consumers.

Strengthening Halal Literacy in Junior High School (Kurnia, 2026) plays an important role because students are increasingly confronted with a wide variety of products and information in the digital age. However, the implementation of halal literacy in science education remains relatively limited and is generally presented only as supplementary material, without being linked to inquiry-based learning or problem-solving. Based on preliminary observations and interviews with science teachers at a junior high school, science instruction continues to focus on conceptual mastery, meaning that the integration of halal literacy has not yet been implemented systematically. Content related to food, fermentation, food additives, and biotechnology has not yet been utilized as a context for developing students' ability to analyze the halal status of a product. As a result, students have not yet gained learning experiences that enable them to integrate scientific knowledge with considerations of halal standards in their daily lives. Therefore, a learning model is needed that can integrate science concepts with halal literacy in a contextual manner. Problem-Based

Learning (PBL) is viewed as a promising approach because it provides an authentic learning experience through the resolution of real-world problems, enabling students not only to understand scientific concepts but also to apply the principles of halal literacy in making critical and responsible decisions. The integration of halal literacy in this study was carried out through the application of Problem-Based Learning to science material related to food and food additives. Students are guided to identify food products found in the school environment using worksheets, then analyze their ingredients and assess the products' halal status based on available information. This activity is expected to provide a contextual learning experience that connects science concepts with the application of halal literacy.

Previous studies have largely focused on the effectiveness of Problem-Based Learning in improving learning outcomes, critical thinking skills, and problem-solving skills. Meanwhile, research on halal literacy generally still addresses aspects of halal knowledge or awareness in general. Research that specifically integrates halal literacy into science education through the Problem-Based Learning model at the junior high school level remains very limited. Therefore, this study aims to address this gap. The novelty of this study lies in the integration of halal literacy into science education through Problem-Based Learning by utilizing food product identification activities within the school environment as the learning context. This approach enables students to relate science concepts to the analysis of a product's ingredients and its halal status. Based on this description, this study aims to describe the integration of halal literacy through Problem-Based Learning in science education at the junior high school level and to analyze students' ability to identify the halal status of food products in the school environment.

RESEARCH METHODOLOGY

This study was conducted at a Madrasah Tsanawiyah (MTs) in Karawang Regency during the odd semester of the 2025/2026 academic year. The research subjects consisted of one science teacher and 23 eighth-grade students. Research data were obtained through interviews with the science teacher and the results of Student Worksheets (LKPD) used to identify food products in the school environment based on halal literacy indicators. The data were analyzed using the Miles, Huberman, and Saldaña interactive analysis model, which includes data condensation, data presentation, and the drawing and verification of conclusions.

RESULTS AND DISCUSSION

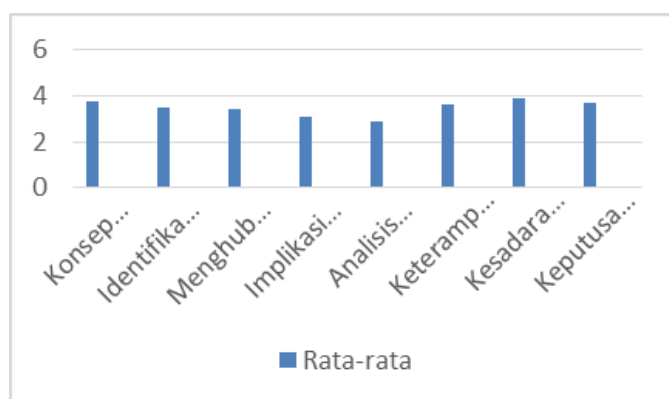
Integrating Halal Literacy through Problem-Based Learning

Science instruction was conducted using the Problem-Based Learning model, focusing on contextual issues related to food sold in the school environment. During the problem-orientation phase, the teacher guided students to observe the various food products available in the school cafeteria. Next, students worked in groups using worksheets to identify product types, ingredients, and halal logos, and to analyze the halal status of the products based on the information they gathered. The activity encourages students to connect science concepts with the application of halal literacy in everyday life.

Next, students work in groups using the Student Worksheet (LKPD). Through the LKPD, students identify selected food products, analyze their ingredients, examine the information on the packaging labels, identify halal logos, and draw conclusions about the products' halal status based on the information they have gathered. Throughout the learning process, teachers act as facilitators who guide students in discussions and in solving the problems presented to them (Hasibuan et al., 2026). Based on observations made during the lesson, students showed enthusiasm for participating in the food product identification activity. This activity encouraged students to read the information on product packaging more carefully and to discuss the ingredients used. Learning that is linked to real-life situations in the school environment provides a more meaningful learning experience because students can connect science concepts with the application of halal literacy in their daily lives.

Analysis of Students' Halal Literacy Based on Worksheets

The analysis of students' halal literacy was conducted based on eight indicators measured through a worksheet for identifying food products in the school environment. The results of the analysis for each indicator are presented in **Table 1**.



Based on Table 1, students demonstrated a good ability to explain the concepts of halal and haram and to identify the ingredients in food products. However, some students still had difficulty analyzing food additives and production processes that could affect a product's halal status. These findings indicate that food identification activities using Problem-Based Learning provide a learning experience that helps students connect science concepts with halal literacy, formulate new theories, and/or modify existing theories.

These findings reinforce the view that halal literacy is not only related to an understanding of what is halal and haram, but also involves the integration of Islamic knowledge and scientific principles, which equips students to make informed consumption decisions. In line with the view that (Cahyanto et al., 2023), Halal literacy, as part of multiliteracy, can be developed through science education because it enables students to integrate scientific concepts with Islamic values in their daily lives. Thus, the application of Problem-Based Learning in science instruction provides students with the opportunity to develop scientific thinking skills while also increasing their awareness in selecting and consuming products that comply with halal principles.

Therefore, the results of this study indicate that integrating halal literacy into science education not only supports students' achievement of academic competencies but also contributes to shaping their character, awareness, and ability to make responsible consumption decisions in accordance with halal principles.

In addition, the implementation of halal literacy integration in schools is a crucial aspect in building students' comprehensive understanding of the concept of halal. Through learning that integrates halal literacy, students not only gain knowledge about the concepts of halal and haram but are also able to apply this knowledge in their daily lives, particularly when selecting and consuming food products. The integration of halal education not only benefits individuals by fostering wiser consumption habits that align with Sharia principles but also contributes to the development of the halal industry, both locally and globally. (Nurdin et al., 2024). Thus, the integration of halal literacy into science education plays a strategic role in preparing the younger generation to be aware of, knowledgeable about, and responsible for the consumption of halal products.

CONCLUSION

This study shows that the implementation of halal literacy integration through Problem-Based Learning in science education is able to provide a contextual learning experience for students. Through activities to identify food products in the school environment using worksheets, students can connect science concepts with the halal aspects of products in everyday life. The results of the analysis based on eight halal literacy indicators show that students have a good ability to understand the concepts of halal and haram, identify product ingredients, relate halal concepts to daily life, and use information on packaging labels as a basis for analyzing a product's halal status. However, students still need further guidance in analyzing food additives and understanding the impact of production processes on a product's halal status.

Interviews with teachers revealed that the implementation of Problem-Based Learning encourages students to engage more actively in discussions, read product packaging more carefully, and become more aware of the importance of choosing halal products. These findings indicate that integrating halal literacy into science education not only supports students' mastery of scientific concepts but also contributes to the development of their critical thinking skills, awareness, and decision-making regarding the consumption of halal products. Therefore, integrating halal literacy through Problem-Based Learning can serve as a relevant alternative approach to science education for developing students' halal literacy in a contextual manner.

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