

## Implementation of halal product usage categories in science education



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### ABSTRACT

Product consumption has increased in line with technological and industrial developments. This study aims to apply halal categories in science education in schools, specifically to improve students' understanding of halal products and their application in everyday life. An interdisciplinary approach is used to integrate scientific concepts with halal literacy through practical activities, discussions, and socialization. Data were obtained through a literature review of articles published between 2017 and 2024 that were relevant to the concepts of halal and halal products. The results of the study show that the application of halal categories in science education not only improves students' understanding of halal products but also encourages them to be more critical in choosing consumer goods. This study also highlights the importance of collaboration between educators, students, and business actors in creating a learning environment that supports halal literacy. Thus, it is hoped that students can contribute to promoting halal products and supporting the growth of the halal industry in Indonesia.

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### INTRODUCTION

In the era of globalization, product consumption has increased in line with technological and industrial developments. This requires society, especially the younger generation, to have the ability to filter information and make wise decisions, including choosing products that are in accordance with religious and health values. Halal literacy, as part of functional literacy, is very important for every individual to have.

In accordance with the provisions of Law Number 33 of 2014 concerning Halal Product Guarantee ([Republik Indonesia, 2014](#)), and its implementing regulations like Government Regulation Number 31 of 2019 concerning implementing regulations of Law Number 33 of 2014 concerning halal product guarantees ([Republik Indonesia, 2019](#)), and Minister of Religious Affairs Decree Number 26 of 2019 concerning the implementation of halal product guarantees ([Kementerian Agama Republik Indonesia, 2019](#)), all used goods that fall under the category of halal-certified products must have a halal certificate. Used goods that are used and utilized by the public that are required to be halal certified are those that contain animal elements. These include clothing, head coverings, and accessories,

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household health equipment, household appliances, Islamic worship equipment, food and beverage packaging, as well as office equipment and stationery. Examples of clothing items include shirts, underwear, socks, and jackets made from animal materials. Headwear includes hats, helmets, and headscarves that also contain animal materials. Accessories include rings, earrings, bracelets, watches, and various other items made from animal materials.

In addition, there are household health supplies such as toothbrushes and toothpicks, household appliances such as sofas and plates, food packaging such as paper and plastic packaging, and office supplies such as ink and paper for printing the Qur'an that come from animals (Jumiono & Rahmawati, 2020). Halal product innovation refers to the development and improvement of products that comply with Islamic food laws and regulations (Bawono et al., 2024). This involves ensuring that ingredients and production processes meet halal standards. "Innovation in halal products involves meeting the needs of Muslim consumers and improving existing products to meet halal requirements. There is a growing demand for halal products in non-Muslim countries due to their perceived educational or health benefits. Universities play an important role in educating and certifying individuals in the halal industry, including in educational goods such as halal-certified laboratory equipment. The Indonesian government faces challenges in accelerating halal certification due to low public awareness, a lack of business involvement, and high certification costs. To meet the growing demand for halal products, innovative solutions and a reliable supply chain are essential. Schools and madrasas play an important role in training professionals and raising awareness about halal products." (Bawono et al., 2024; Rosita et al., 2023).

By investing in research and development, companies can stay ahead of the competition and capture a larger share of the halal market, especially in products for science education. Halal product innovation also involves educating consumers about the benefits of choosing halal products and building trust among the Muslim community (Rosita et al., 2023). By continuously improving and expanding their halal product offerings, companies can tap into a lucrative and rapidly growing market while also promoting ethical and sustainable practices. Ultimately, halal product innovation is crucial for businesses that want to thrive in the global market and meet the diverse needs of consumers worldwide. By creating innovative halal products, companies can differentiate themselves from competitors and attract a loyal customer base. Additionally, collaborating with halal certification bodies and adhering to strict halal standards can help companies gain credibility and position themselves as trusted brands in the halal industry. The implementation of halal product innovation not only benefits businesses financially but also contributes to the growth and development of the halal market, which ultimately promotes a more inclusive and diverse economy. Commitment to innovation and quality assurance can also increase opportunities for partnerships and global expansion in the halal industry (Saifuddin & Setiawan, 2025).

Ultimately, adopting halal product innovation is not only a business strategy but also a reflection of a company's commitment to serving diverse communities and promoting ethical practices in the marketplace. By prioritizing halal product development, companies can demonstrate their commitment to meeting the needs of Muslim consumers and supporting their values. This not only helps build trust and loyalty among this demographic but also opens new opportunities for growth and market reach. As more companies adopt halal product innovation, we can expect the creation of a more inclusive and sustainable economy that benefits all parties involved. By investing in research and development to create high-quality halal products, companies can also demonstrate their innovation and flexibility in meeting ever-changing market demands. The commitment to producing halal goods not only fosters a sense of inclusivity but also encourages a more environmentally friendly and socially responsible approach to business. Ultimately, the emergence of halal products reflects a shift towards a more conscious consumer culture that values transparency, integrity, and respect for diverse beliefs and practices. As this trend continues to evolve, halal product innovation is not merely a passing trend but a fundamental aspect of sustainable and responsible business practices in the modern economy.

Halal product innovation also opens new opportunities for businesses to enter the growing market segment and meet the needs of a diverse customer base. "Halal certification is essential for entering the growing global halal market, ensuring that products comply with strict Islamic dietary laws and building trust among Muslim consumers. This makes it easier for small, micro, and medium enterprises

(MSMEs) to serve a diverse customer base and expand their market reach. Online marketing, especially on social media platforms, offers MSMEs a wide reach, targeted marketing, cost efficiency, interaction, and data insights to connect with diverse customer groups." (Hidayat & Witta, 2024).

By adopting halal practices, companies can differentiate themselves from competitors and build trust with consumers who are increasingly seeking ethical and sustainable products. The shift toward halal products is driven not only by religious considerations but also by the desire to seek healthier and more natural alternatives that align with modern values regarding health and ethical consumption. As such, the rise of halal products reflects a broader trend toward conscious consumption and a reevaluation of traditional business practices amid changing societal norms and values. Companies that prioritize halal practices not only meet the demands of a growing market segment but also position themselves as leaders in ethical business. By aligning their values with those of consumers, these companies can build loyalty and credibility that can differentiate them in an increasingly competitive market. With consumers increasingly prioritizing ethical considerations in their purchasing decisions, the shift towards halal products signals a larger movement towards sustainability, transparency, and social responsibility in the global economy.

## RESEARCH METHOD

### Methods

This study uses ideas relevant to the case or problem found and a non-systematic literature review approach. A literature review is a written summary of articles in books, journals, and LAN papers that describe past and present theories and knowledge, compiled according to the theme and required documents (Creswell, 2014; Habsy, 2017).

Relevant references for the case were searched for using Google Scholar and Reflective Journal databases. The research sources used were studies published in journals. The research articles used in this study were published between 2017 and 2024. The keywords used in searching for research articles in the Publish or Perish database were "Halal" and "Goods." The type of research selected was research articles in Indonesian and English that had been completed. Based on this method, 30 articles were obtained and then processed using VOSviewer software version 1.6.18, a release that offers various features for bibliometric data analysis that serve to create and visualize bibliometric networks. VOSviewer serves as a powerful tool in bibliometric analysis and is particularly relevant to descriptive methods. With its ability to visualize data, analyze trends, and evaluate data quality, VOSviewer provides in-depth and comprehensive insights into scientific literature, helping researchers understand and describe phenomena in an academic context. The data obtained is then analyzed using descriptive analysis methods. Descriptive analysis methods are carried out by describing the facts, followed by analysis, not only describing but also providing adequate understanding and explanation. The research methodology is clearly presented in Table 1.

Table 1. Research methodology.

Aspect	Description
Type of Research	Non-systematic literature review
Research Approach	Qualitative descriptive
Data Sources	National and international journal articles
Databases	Google Scholar and Reflective Journal
Publication Period	2017 – 2024
Keywords	"Halal", "Goods"
Number of Articles	30 articles
Analysis Tool	VOSviewer version 1.6.18
Analysis Technique	Bibliometric analysis and descriptive analysis

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## RESULT AND DISCUSSION

Halal literacy is an important concept in various aspects of life, including education. In science education, halal literacy can be applied to the category of goods used as teaching materials. This article will discuss the importance of halal literacy in the context of science education in schools and how this can increase awareness of the importance of halal products in everyday life.

### The Concept of Halal Literacy

Halal literacy can be defined as an individual's ability to understand and evaluate the halal status of a product, which includes knowledge, awareness, and skills in identifying products that meet halal standards. According to Setyowati and Anwar, halal literacy includes three main indicators. The indicators of halal literacy cover several aspects that are important for understanding and applying halal principles in daily life, especially in the context of food consumption.

**Halal Awareness:** Halal awareness refers to an individual's understanding of the principles of halal and haram in Islam, as well as the importance of choosing products that comply with sharia law. Indicators of halal awareness include Education and Knowledge: Understanding the basics of Islamic law related to food and drink, as well as the consequences of ignoring halal principles. Consumer Behavior: This awareness encourages individuals to be more selective in choosing products, considering their origin and production process. Socialization: Halal awareness is also influenced by the social and cultural environment, including family, community, and media.

**Food Ingredients:** Food ingredients are a component that must be considered in determining the halal status of a product. This includes the origin of the ingredients, the processing methods, and any additives used. Food ingredient indicators include Origin of Ingredients: Understanding whether food ingredients come from halal sources, such as meat from animals slaughtered in accordance with Islamic law. Processing: Knowing whether the processing does not mix haram or non-halal ingredients, such as alcohol or ingredients from animals that are not slaughtered in a halal manner. Additives and Other Ingredients: Checking the additives used in the product, including colors, preservatives, and flavorings, and ensuring they are halal certified.

**Halal certification** is official recognition from an authorized institution that a product meets halal criteria under Islamic law. Certification Process: Understanding the process that products undergo to obtain halal certification, including audits and inspections by authorized institutions. Trust and Transparency: Certification guarantees that products have been thoroughly inspected, giving consumers confidence that they are truly halal. The Importance of Halal Labels: Knowing how to read and understand halal labels on product packaging, as well as knowing the institutions that issue recognized halal certification (Setyowati & Anwar, 2022). This shows that halal literacy is not only limited to knowledge about food and beverages, but also includes an understanding of cosmetics, toiletries, and the halal industry. Therefore, halal literacy plays an important role in shaping the Islamic lifestyle, especially among students who are agents of change in society (Amrin et al., 2022).

The importance of halal literacy can also be seen from its influence on people's consumption behavior. Research shows that halal and religious literacy are significantly related to interest in consuming halal products (Pratama & Hartati, 2021). This indicates that individuals with high levels of halal literacy tend to prefer products that are guaranteed halal. Empirical data show that halal literacy not only affects a person's level of understanding of halal laws and benefits but also has a significant influence on their decisions in choosing halal products. Research on the people of Central Java found that halal literacy has a positive and significant effect on the decision to purchase halal food products, meaning that individuals with high halal literacy tend to prefer products that are guaranteed halal over options without halal guarantees. Additionally, studies on consumers in East Jakarta and on halal MSMEs in Tebo Regency also show that halal literacy increases consumer confidence and interest in purchasing halal-labeled products, reinforcing the evidence that halal literacy has a direct impact on daily consumption behavior (Aula & Anwar, 2024).

Furthermore, halal certification is an important aspect in the food and beverage industry, especially for Micro and Small Enterprises (MSEs), as it can increase consumer awareness and trust in the products they consume. Various studies show that halal certification not only serves as proof of compliance with Islamic law but is also a crucial aspect in the development of the food and beverage

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industry, especially for MSMEs. In addition, halal certification also helps MSMEs expand market access, meet legal requirements, and increase product competitiveness in an increasingly competitive market. For example, a study in Yogyakarta city found that halal certification is important for food and beverage MSMEs to eliminate consumer doubts about the halal status of their products (Hasbi & Sulistiyan, 2025). In Bengkulu, empirical data show that culinary MSMEs with halal certification have experienced a significant increase in income (Akbar et al., 2025), while research in the Tulungagung culinary area shows that halal certification increases consumer trust and loyalty (Rahmawati & Sul-toni, 2025). In addition, halal certification also helps MSMEs expand market access, meet legal requirements, and increase product competitiveness in an increasingly competitive market.

A survey among Muslim students in Malaysia shows that 75% of respondents choose food in restaurants that are halal-certified, even though there are other cheaper options. This indicates a direct relationship between halal literacy and consumption decisions (Fibrianto et al., 2024). Therefore, halal literacy serves as a bridge between knowledge and consumption practices that are in accordance with Sharia principles. In the context of education, halal literacy needs to be instilled in students from an early age so that they can become smart and responsible consumers. Education on halal literacy is an important effort to increase public understanding, especially among students, of the concepts and practices of halal in products and services. Halal literacy includes knowledge of halal principles, the halal certification process, and an understanding of the importance of choosing products that comply with Islamic law. In this context, Putro et al. (2024) emphasizes that education on halal literacy can be carried out through various socialization and training programs involving students and business actors. These socialization and training programs can include various forms of activities, such as seminars, workshops, practical training, and information campaigns. These activities aim to increase knowledge. Through these programs, students can gain a deep understanding of the concept of halal, including the legal, ethical, and health aspects related to halal products. Practical Involvement: Training that involves businesses provides opportunities for students to learn directly from industry practitioners. This can include visits to factories, panel discussions with halal entrepreneurs, and firsthand experience in the halal certification process. Networking: Involving students and businesspeople in these programs can also help build strong networks between academia and industry. This is important for creating mutually beneficial collaborations in halal product development. Student Contribution to Halal Product Promotion. By increasing halal literacy among students, it is hoped that they can contribute to promoting halal products and supporting the growth of the halal industry in Indonesia.

Overall, education on halal literacy through outreach and training programs involving students and businesspeople is a strategic step to increase understanding and awareness of the importance of halal products. Thus, students not only become smart consumers but also play an active role in promoting and supporting the growth of the halal industry in Indonesia. This effort is in line with Indonesia's vision to become a global halal industry hub, which is expected to have a positive impact on the economy and society. With the huge potential of the global halal market, Indonesia can expand its domestic halal product market to the international market. Through policies such as the Indonesian Halal Industry Master Plan and halal certification, the government is strengthening Indonesia's position in the global market. Halal certification increases consumer confidence and provides benefits for MSMEs, such as increased income and wider market access. The halal industry in Indonesia is expected to strengthen the competitiveness of local products, create jobs, and encourage sustainable economic growth (Putro et al., 2022). Therefore, the development of halal literacy is mandatory to create a society that is more aware of the importance of halal in every aspect of life.

Halal certification criteria for used goods cover several important aspects that must be met by businesses. First, products submitted for certification must be guaranteed halal, both in terms of the raw materials used and the production process. According to Syariva, MSME businesses must ensure that the products they offer are risk-free and use ingredients that have been confirmed halal (Syariva et al., 2024). In addition, the production process must also meet established halal standards, which include cleanliness, safety, and halal compliance at every stage of production through packaging (Raehanah et al., 2024). This is important to ensure that consumers know that the goods they use are in accordance with Sharia principles.

In addition, in the context of halal certification implementation, there are challenges faced by business actors, especially MSMEs. The obligation to obtain halal certification is mandatory under Law Number 33 of 2014 concerning Halal Product Guarantee, which requires business actors to meet certain criteria (Rofullah et al., 2024). These criteria not only cover the aspect of product compliance with Sharia law but also involve the completeness of documents and procedures that must be fulfilled (Muhamad, 2020). Therefore, assistance in the halal certification process is crucial to help businesses understand and meet the established criteria so that they can obtain the halal certificate needed to increase the competitiveness of their products in the market (Chusniati et al., 2023).

### **Implementation of halal literacy in science education**

Learning methods that support halal literacy are essential for improving students' understanding and awareness of halal concepts in various aspects of life. One method that can be applied is the project-based learning model, which allows students to be directly involved in activities related to halal products. Through this approach, students not only learn about halal theory, but can also conduct research, analysis, and presentations on halal products around them. Research shows that project-based learning methods can increase student engagement and deepen their understanding of halal literacy, as they learn through practical experience and collaboration with classmates (Abidin, 2020). Empirical research shows that project-based learning not only increases student engagement and thinking skills but also deepens their understanding of the material being studied. For example, a study by Al Fikri et al. (2024) found that the Project-Based Learning model significantly improved students' critical reasoning skills and learning outcomes, including in the context of Islamic Religious Education, which contains religious values, so that learning becomes more relevant and meaningful for students. Additionally, research at Lengayang Technology Vocational School shows that the application of PjBL in Islamic Religious Education significantly increases students' interest, engagement, and understanding of learning material because they are directly involved in working on contextual and relevant projects. Supporting research by Abidin (2020) also shows that PjBL integrated with literacy can improve students' connection skills, reflecting the role of this approach in deepening students' conceptual understanding and engagement in the learning process.

One example of the application of project-based learning models in the context of halal can be seen in research that developed student worksheets based on PJBL. This research shows that this model can improve students' understanding of the material being taught and encourage students to be more active in the learning process (Arsana & Sujana, 2021; Nisa & Harrista, 2022). In addition, other studies also show that the project-based learning model can be used to teach more complex concepts, such as in chemistry, where students can conduct experiments related to the halal status of products (Nisa & Harrista, 2022).

In the context of halal, it is important to integrate knowledge about halal into learning. For example, research on genetic marker detection for halal authentication shows that a bioinformatics approach can be used to ensure the halal status of DNA-based products. This shows that students can learn about the importance of halal in a scientific and technological context, which can be integrated into project-based learning models.

In addition, research examining the effectiveness of project-based learning models in improving environmental awareness is also relevant, as this can be linked to an understanding of environmentally friendly halal products (Rose et al., 2023). By combining project-based learning models with contemporary issues such as sustainability and ethics, students not only learn about halal but also about their social responsibilities. Therefore, the application of project-based learning models in halal material not only improves students' academic understanding but also equips them with important practical skills and social awareness. This shows that PPA is a very effective method for teaching complex material that is relevant to the needs of today's society.

In addition, integrating science literacy into learning can also contribute to the development of halal literacy. By combining the concepts of science, technology, and ethics in the context of halal, students can understand the importance of halal from a scientific and social perspective. For example, in science lessons, teachers can teach about the ingredients used in products and how the production process can affect the halal status of an item. This method not only improves students' science literacy

but also equips them with relevant knowledge to make the right decisions in choosing halal products. Therefore, the application of innovative and interactive learning methods is necessary to support halal literacy among students. By acknowledging that halal literacy is closely related to scientific literacy, we can develop an integrated learning approach that enables students to develop a holistic understanding of the relationship between scientific knowledge and religious values within the context of halal literacy (Table 2). This becomes important in preparing a generation that is not only scientifically literate but also possesses ethical and religious awareness in making consumption decisions. Based on an analysis of scientific literacy, chemical literacy, and evidence from the Qur'an and Hadith, halal literacy indicators can be formulated as follows.

**Table 2.** Halal literacy indicators.

No	Halal Literacy Indicators	Aspects	Dimensions
1	Able to explain the concept of halal and haram in Islam, and identify the evidence from the Quran and Hadith regarding the halalness of products.	Understanding the concept of halal and haram	Content
2	Able to identify materials and production processes commonly used in products and explain the impact of these materials and processes on the halal status of the product.	Mastery over halal products	Content
3	Able to connect the concept of halal with daily consumption decisions.	Relating concepts to everyday life	Context
4	Able to explain the implications of halal literacy in everyday situations.	Relating concepts to everyday life	Context
5	Assess the ingredients used in a product and understand the production process, including the use of technology in the context of halal.	Analysis of materials and production processes	Competence
6	Apply research skills to dig up information related to halal certification, understand how to read labels, and access halal literacy information sources.	Research skills	Competence
7	Have awareness of the impact of consumption on health and environmental sustainability.	Awareness of the impact of consumption	Attitude
8	Able to make responsible consumption decisions.	Awareness of the impact of consumption	Attitude

The use of halal-certified items in science experiments can add value to science learning in schools. By using these items, students not only learn scientific concepts, but also understand the importance of halal compliance in the products they use. For example, in experiments involving chemicals or laboratory equipment, the use of halal-certified items ensures that students focus not only on the results of the experiment, but also on ethical aspects and compliance with Sharia principles. This is in line with efforts to improve students' science literacy, where they are taught to connect scientific knowledge with values relevant to everyday life (Nuridin et al., 2024).

In addition, the use of halal items in science experiments can also enhance students' creativity and innovation. By integrating halal items, students are encouraged to think critically and find creative solutions when conducting experiments. For example, students can use natural ingredients that have been certified halal to conduct experiments on chemical reactions or the physical properties of substances. This approach not only makes learning more interesting but also instills awareness of the importance of choosing halal products in everyday life. Therefore, the use of halal-certified items in science experiments can be an effective means of developing science literacy while reinforcing halal values among students (Fitriani et al., 2023).

The challenges in applying halal literacy to the category of used goods in science education include several aspects, ranging from teacher understanding to the availability of adequate resources.

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One of the main challenges is the lack of teacher understanding of the concept of halal literacy and how to integrate it into the science learning curriculum. As stated by Cahyanto, many teachers do not fully understand the importance of halal literacy in the context of science education, making it difficult for them to design relevant learning activities (Cahyanto et al., 2023). In addition, limited resources, such as access to certified halal goods, also pose an obstacle. Without the support of schools in providing appropriate tools and materials, efforts to teach halal literacy effectively will be hampered.

Research shows that the challenges of implementing halal literacy in science education do not only come from teachers, but also from students' attitudes, who are not yet fully aware of the importance of halal literacy in their daily lives. To overcome this, a more innovative learning approach is needed, such as Project-Based Learning that integrates halal literacy in the context of science. For example, a study by Firdaus et al. (2024) shows that project-based learning with halal literacy can increase students' awareness of halal literacy and their involvement in science learning, so that students not only understand scientific concepts but also relate them to halal values that are relevant to their lives. This approach, which combines science and the halal context, is also supported by STEM designs that integrate halal literacy into teaching materials, where students are required to make scientific decisions in accordance with sharia principles.

Strategies to overcome challenges in implementing halal literacy in the category of consumer goods in science education can be done through increased teacher training and professional competency development. This training needs to be directed towards a deep understanding of halal literacy and how to integrate it into the science curriculum. Professional teacher training has been proven to improve their pedagogical and methodological competencies, which are needed when implementing new learning approaches, such as halal literacy, effectively and contextually in science education (Siregar et al., 2025). In addition, collaboration between schools and halal certification bodies can help provide the necessary resources, such as halal-certified consumables, so that teachers and students can conduct experiments with tools and materials that comply with halal standards.

In addition, it is important to raise students' awareness of halal values and their impact on health and safety. This strategy can be implemented through a project-based learning approach that encourages students to be directly involved in research and experiments using halal products. Research by Sumantri et al. (2023) shows that a positive attitude toward halal products has a significant effect on purchase intention, reflecting that when individuals have a positive attitude toward halal-certified products, they tend to be more motivated to understand and appreciate halal in practical and scientific contexts. This supports the idea that learning that links scientific concepts with halal values can help students develop critical attitudes and strong awareness of the products they use and consume. By linking halal literacy with health and safety aspects, students not only learn about science but also develop critical attitudes towards the products they use in their daily lives. Through a combination of teacher training and student engagement, it is hoped that halal literacy can be well integrated into science learning.

## CONCLUSION

Learning methods that support halal literacy are essential to enhance students' understanding and awareness of halal concepts across various aspects of life. Project-based learning is an effective approach because it actively involves students in activities related to halal products, enabling them to move beyond theoretical knowledge by conducting research, analysis, and presentations on halal products in their surroundings. This method has been shown to increase student engagement and deepen understanding through practical experience and collaboration. Additionally, the use of certified halal used goods in science experiments can enrich science learning by helping students understand scientific concepts while recognizing the importance of halal status in the products they use. However, implementing halal literacy in the category of used goods within science education faces several challenges, including limited teacher understanding of halal literacy and insufficient learning resources. These challenges can be addressed through enhanced teacher training and competency development, which are crucial to fostering students' awareness of halal values and their impact on health and safety.

## REFERENCES

- Abidin, Z. (2020). Efektivitas pembelajaran berbasis masalah, pembelajaran berbasis proyek literasi, dan pembelajaran inkuiri dalam meningkatkan kemampuan koneksi matematis. *Profesi Pendidikan Dasar*, 7(1), 37–52. <https://doi.org/10.23917/ppd.v7i1.10736>
- Akbar, M. R., Arisandy, Y., & Syaifudin, S. (2025). Analisis pengaruh sertifikasi halal dan modal terhadap pendapatan usaha mikro kecil dan menengah (UMKM) sektor kuliner di Kecamatan selebar Kota Bengkulu. *Jurnal Cendekia Ilmiah*, 4(5), 2007–2021.
- Al Fikri, D. I., Wachidi, W., & Shobahiya, M. (2024). The effect of the project-based learning (PjBL) model on students' critical reasoning and learning achievement in islamic education based on the SDGs. *Profetika: Jurnal Studi Islam*, 25(02), 547–566. <https://doi.org/10.23917/profetika.v25i02.7556>
- Amrin, A., Supriyanto, S., & Ardiansyah, A. (2022). Analisis literasi halal dalam membentuk gaya hidup islami di perguruan tinggi islam (Studi pada mahasiswa Universitas Islam Negeri Raden Mas Said Surakarta). *Fikrah: Journal of Islamic Education*, 6(1), 1. <https://doi.org/10.32507/fikrah.v6i1.1311>
- Arsana, I. W. O. K., & Sujana, I. W. (2021). Pengembangan lembar kerja peserta didik (LKPD) berbasis project based learning dalam muatan materi IPS. *Jurnal Imiah Pendidikan Dan Pembelajaran*, 5(1), 134. <https://doi.org/10.23887/jipp.v5i1.32817>
- Aula, I., & Anwar, A. Z. (2024). Pengaruh religiusitas, literasi halal, dan perilaku konsumen terhadap keputusan pembelian produk makanan halal pada masyarakat di Jawa Tengah. *Jurnal Ekonomi Syariah Pelita Bangsa*, 9(02), 341–355. <https://doi.org/10.37366/jespb.v9i02.1811>
- Bawono, A., Waluyo, A., & Widiyanto, A. (2024). Strategies to Inelasticize the Halal Food Industry in Indonesia. *OIKONOMIKA: Jurnal Kajian Ekonomi dan Keuangan Syariah*, 5(1), 80–100. <https://doi.org/10.53491/oikonomika.v5i1.1194>
- Cahyanto, T., Al Zahro, I. R., & Windayani, N. (2023). Konsep dan implementasi literasi halal pada pembelajaran IPA. *Jurnal Penelitian Sains dan Pendidikan*, 3(2), 158–172. <https://doi.org/10.23971/jpsp.v3i2.7237>
- Chusniati, A., Hikmah, L. U. B. R., Salsabila, A. N., Fi'liya, N., Pramita, E. D., Nurlaeli, S., & Widyaningsih, R. (2023). Pendampingan sertifikasi halal kepada pelaku UMKM Gropak di Desa Karangdadap. *Solidaritas: Jurnal Pengabdian*, 3(2), 205–214. <https://doi.org/10.24090/sjp.v3i2.9551>
- Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed method approaches*. SAGE Publication, Inc.
- Fibrianto, K., Wirawan, N. N., Wulan, S. N., Miftachurrochmah, A., Larasati, T., Istianah, H., & Ariza, N. F. (2024). Sosialisasi dan pendampingan sertifikasi halal melalui SIHALAL pada UMK makanan minuman di Desa Wonorejo Kabupaten Malang. *Jurnal Abmas Negeri*, 5(1), 60–68. <https://doi.org/10.36590/jagri.v5i1.844>
- Firdaus, M. T., Wulandari, I. A., Windayani, N., & Supriadin, A. (2024). Product awareness and learning motivation on plantae topics through project-based learning with halal literacy. *Jurnal Pendidikan Biologi*, 9(2), 332–345. <https://doi.org/10.31932/jpbio.v9i2.4008>
- Fitriani, N., Hidayat, S., & Sholih, S. (2023). Pengembangan lembar kerja peserta didik elektronik berbasis literasi sains pada materi tekanan zat dan penerapannya. *Jurnal Teknologi Pendidikan*, 12(1), 112–130. <https://doi.org/10.32832/tek.pend.v12i1.7581>
- Habsy, B. A. (2017). Seni memahami penelitian kualitatif dalam bimbingan dan konseling: Studi literatur. *Jurnal Konseling Andi Matappa*, 1(2), 90–100. <https://doi.org/10.31100/jurkam.v1i2.56>
- Hasbi, A. N., & Sulistiyani, A. (2025). Peran sertifikasi halal pada pelaku UMKM makanan dan minuman di Yogyakarta. *Jurnal Cendekia Ilmiah*, 4(3), 3114–3122.
- Hidayat, M. T., & Witta, S. R. (2024). Halal certification and implications for MSMEs: A systematic literature review. *Journal of Business Management and Islamic Banking*, 3(2), 151–166. <https://doi.org/10.14421/jbmib.v3i1.2373>
- Jumiono, A., & Rahmawati, S. I. (2020). Kriteria sertifikasi halal barang gunaan di Indonesia. *Jurnal Ilmiah Pangan Halal*, 2(1), 10–16.

- Kementerian Agama Republik Indonesia. (2019). *Peraturan menteri agama Republik Indonesia nomor 26 tahun 2019 tentang penyelenggaraan jaminan produk halal*.
- Muhamad, M. (2020). Tantangan dan peluang penerapan kebijakan mandatory sertifikasi halal (Studi implementasi UU No. 33 Th. 2014 dan PP No. 31 Th. 2019). *Jurnal Ilmu Ekonomi dan Bisnis Islam*, 2(2), 1–26. <https://doi.org/10.24239/jiebi.v2i2.29.1-26>
- Nisa, A. R. K., & Harrista, S. (2022). Efektivitas model pembelajaran PJBL (Project based learning) terhadap pemahaman materi kimia pada pembelajaran jarak jauh. *Widyacarya: Jurnal Pendidikan, Agama dan Budaya*, 6(2), 141. <https://doi.org/10.55115/widyacarya.v6i2.2008>
- Nurdin, M. A., Anwar, D. M., Cahyanto, T., & Windayani, N. (2024). Pengembangan indikator literasi halal: Dari teori ke ruang kelas pembelajaran IPA. *Indonesia Journal of Halal*, 7(1), 45–54.
- Pratama, D. B., & Hartati, N. (2021). Pengaruh literasi halal dan religiositas terhadap konsumsi produk halal pada mahasiswa MKS UIN Sunan Gunung Djati Bandung. *Finansha: Journal of Sharia Financial Management*, 1(2), 1–12. <https://doi.org/10.15575/fsfm.v1i2.11024>
- Putro, H. S., Fatmawati, S., Purnomo, A. S., Rizqi, H. D., Martak, F., Nawfa, R., Pamela, E., Putra, C. A., Tsani, I. M., Salsabila, A., Wasatya, S., Adinata, M. F., & Sari, F. L. (2022). Peningkatan nilai produk dan pendampingan dalam proses sertifikasi halal untuk UMKM di Kecamatan Gedangan, Sidoarjo. *Sewagati*, 6(3). <https://doi.org/10.12962/j26139960.v6i3.131>
- Putro, H. S., Purnomo, A. S., Rizqi, H. D., Putra, S. R., Wilujeng, S. A., Indrawan, I. A., Zahra, E. A. A., Oktafia, G. K., Azzahira, S., Abdillah, S. P., Yediya, H., Sabilla, W., Pangayom, D. L., Nurhayati, A., Yulianengtiyas, A., Prasetyowati, M., & Aldianita, A. K. (2024). Pengembangan kawasan halal Desa Kare, Kabupaten Madiun melalui kampanye gerakan menuju sertifikasi halal (GEMESH). *Sewagati*, 8(3), 1741–1748. <https://doi.org/10.12962/j26139960.v8i3.1037>
- Raehanah, R., Hajaroh, S., Sakinah, A. B., & Dewi, N. (2024). Pendampingan produksi UMKM menuju sertifikasi halal di Desa Barabali. *Participative Journal: Jurnal Pengabdian Pada Masyarakat*, 4(2), 145–152. <https://doi.org/10.55099/participative.v4i2.137>
- Rahmawati, A., & Sultoni, H. (2025). Peran sertifikasi halal dalam meningkatkan kepercayaan dan loyalitas konsumen terhadap produk makanan dan minuman di kawasan kuliner halal Kabupaten Tulungagung. *EKSYPAR: Jurnal Ekonomi Syariah & Bisnis Islam*, 12(1), 103–123. <https://doi.org/10.54956/eksypar.v12i01.717>
- Republik Indonesia. (2014). Undang-undang Republik Indonesia nomor 33 tahun 2014 tentang jaminan produk halal. In *Kementerian Sekretariat Negara Republik Indonesia (Undang-Undang Republik Indonesia nomor 33 tahun 2014)*. Kementerian Sekretariat Negara Republik Indonesia.
- Republik Indonesia. (2019). *Peraturan pemerintah (PP) nomor 31 tahun 2019 tentang peraturan pelaksanaan undang-undang nomor 33 tahun 2014 tentang jaminan produk halal*.
- Rofiullah, A. H., Ash Shiddiqi, H., & Safithri, A. (2024). Membangun kesadaran pengurusan sertifikasi halal pelaku UMKM sebagai upaya meningkatkan daya beli masyarakat prespektif ekonomi syariah. *Jurnal ESA*, 6(1), 11–22. <https://doi.org/10.58293/esa.v6i1.91>
- Rose, A., Sumarmi, S., & Marlina, M. (2023). Efektivitas model project based learning dengan pembelajaran outdoor dalam meningkatkan sikap peduli lingkungan peserta didik pada materi mitigasi bencana alam. *Jurnal Integrasi dan Harmoni Inovatif Ilmu-Ilmu Sosial*, 3(5), 452–460. <https://doi.org/10.17977/um063v3i5p452-460>
- Rosita, P. D., Anwar, A. A., & Rahmahwaty, R. (2023). Persepsi masyarakat terhadap wisata halal di Kabupaten Pringsewu. *Jurnal Ekonomi Syariah dan Pariwisata Halal*, 2(1), 27–32. <https://doi.org/10.70371/jseht.v2i1.71>
- Saifuddin, W. A., & Setiawan, F. (2025). Digital innovation, sustainability principles, and multi-sector diversification models of Indonesia's halal industry: an analysis of sharia economic transformation. *Journal of Halal Product and Research*, 8(2), 225–236. <https://doi.org/10.20473/jhpr.vol.8-issue.2.225-236>
- Setyowati, A., & Anwar, Moch. K. (2022). Pengaruh literasi halal dan religiositas terhadap minat konsumsi produk halal masyarakat Kabupaten Madiun. *Lisan Al-Hal: Jurnal Pengembangan Pemikiran dan Kebudayaan*, 16(1), 108–124. <https://doi.org/10.35316/lisanalhal.v16i1.108-124>

- 
- Siregar, Z. A. B., Arsyad, J., Hanum, A., Ritonga, M., & Mohd Jamil, M. R. (2025). Teachers' professional development and reinforcement at integrated islamic schools in Indonesia. *Jurnal Ilmiah Islam Futura*, 25(1), 117–133. <https://doi.org/10.22373/jiif.v25i1.25068>
- Sumantri, D., Sakti, I. W., & Gustiana, I. (2023). Analysis of purchase intention with attitude toward halal products as a mediating variable in the Indonesian ice cream industry. *Istinbath*, 22(2), 207–220. <https://doi.org/10.20414/ijhi.v22i2.649>
- Syariva, L., Nasik, K., & Ardyansyah, F. (2024). A model for supporting halal certification through the self-declaration pathway in Bakorwil IV Pamekasan from the perspective of masalah. *West Science Law and Human Rights*, 2(01), 21–27. <https://doi.org/10.58812/wslhr.v2i01.387>