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Systematic Literature Review of Scientific Approaches in Islamic Education Pedagogy

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Abstract
The scientific approach has become increasingly popular in Islamic Religious Education (PAI) and has been widely applied in the learning process, particularly focusing on specific topics and materials. This study aims to systematically summarize and analyze various research on the implementation of the scientific approach in PAI, identify its impact on improving student learning achievements and interest, and uncover the challenges and opportunities that may be faced in the future. The research method used in this study is a systematic literature review, where the researcher collected 20 scholarly articles from many journals obtained through the Publish or Perish application, with selection criteria that include topic relevance and research findings that provide insights into the scientific approach over the past five years. The results show that the application of the scientific approach has been proven to improve critical thinking skills, learning interest, and academic achievement among students. This approach also helps improve students' understanding of learning materials and fosters better character development and critical thinking skills. However, its implementation faces challenges, particularly related to the availability of relevant learning resources and the lack of teachers' skills in implementing the scientific approach, but this can be overcome by providing them with some training. And then, there are significant opportunities, such as the use of technology and cross-disciplinary collaboration, which can enhance the effectiveness of learning.
Keywords: Scientific Approach; Islamic Religious Education Learning; Systematic Literature Review.

Abstrak
Pendekatan saintifik semakin populer dalam pembelajaran Pendidikan Agama Islam (PAI) dan telah banyak diterapkan dalam proses pembelajaran dengan fokus pada topik dan materi tertentu. Penelitian ini bertujuan untuk merangkum dan menganalisis secara sistematis berbagai penelitian mengenai implementasi pendekatan saintifik dalam pembelajaran PAI, mengidentifikasi dampaknya terhadap peningkatan prestasi belajar dan minat belajar siswa, serta mengungkap tantangan dan peluang yang mungkin dihadapi di masa depan. Metode yang digunakan dalam penelitian ini adalah tinjauan pustaka sistematis, di mana peneliti mengumpulkan 20 artikel ilmiah dari beberapa jurnal yang diperoleh melalui aplikasi Publish or Perish, dengan kriteria seleksi yang mencakup relevansi topik dan hasil penelitian yang memberikan wawasan tentang pendekatan saintifik dalam lima tahun terakhir. Hasil penelitian menunjukkan bahwa penerapan pendekatan saintifik terbukti dapat meningkatkan keterampilan berpikir kritis, minat belajar, serta prestasi akademik siswa. Pendekatan ini juga membantu meningkatkan pemahaman siswa terhadap materi pembelajaran serta membentuk karakter dan keterampilan berpikir kritis yang lebih baik. Meskipun demikian, penerapannya menghadapi tantangan, terutama terkait dengan ketersediaan sumber belajar yang relevan dan kekurangan keterampilan guru dalam mengimplementasikan pendekatan saintifik, namun hal ini dapat diatasi dengan menyediakan pelatihan bagi mereka. Kemudian, terdapat peluang besar, seperti pemanfaatan teknologi dan kolaborasi lintas disiplin, yang dapat meningkatkan efektivitas pembelajaran.
Keywords: Pendekatan Saintifik; Pembelajaran Pendidikan Agama Islam; Sistematika Literature Review.

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Introduction

In the current era of globalization and information technology advancement, the educational process has undergone a significant transformation, including in the field of Islamic Religious Education (PAI). Islamic Religious Education, as one of the important pillars in the formation of character and understanding religious values for the younger generation, is faced with the challenge of adapting to the rapid development of the times and creating opportunities to develop broader insights in using Islamic religious teaching methods. In a world that is increasingly connected and influenced by various global cultures, religious education is not only required to maintain traditional values, but also new ways are needed to help understand and practice religious teachings. One such method is the use of a scientific approach.

A scholarly or scientific approach in Islamic religious education offers a more rational and measurable perspective in understanding religious teachings. By utilizing research methods based on facts, data, and objective analysis[1], this approach allows the process of religious learning to be more critical, systematic, and relevant to the times. Although not everything in religion can be explained scientifically, at the very least, this approach is very helpful in strengthening a deeper understanding, as well as facilitating the search for more objective answers to various questions that arise in the context of modern life. With a scientific approach, students can see that the teachings of Islam are not only relevant in a spiritual context, but also related to their social and scientific life.

This is in line with curriculum reform efforts that focus on developing 21st century skills. In PAI learning with the 2013 curriculum, all levels of education use a scientific approach that includes 3 areas of education, namely the realm of attitude, the realm of knowledge, and the realm of skills[2]. Meanwhile, in the independent learning curriculum, the application of learning through a scientific approach is reflected in activities such as observing, questioning, experimenting, analysing, presenting, concluding, and creating. So that finally the scientific approach fosters awareness that religion and science are not contradictory, but complement each other and form a generation that has a holistic understanding of religion and the world.

The research on the scientific approach in learning Islam has been discussed a lot before, including; optimization of scientific approaches in learning Islamic religious education[3], scientific approaches in the development of Islamic religious learning methods and strategies in Indonesia[4], scientific approaches in increasing student activity in Islamic religious learning in high schools[5], analysis of the implementation of scientific learning approaches in Islamic religious education learning at SD al wathoniyah 09 Penggilingan Jakarta[6], the implementation of scientific approaches and authentic assessments in PAI learning at SMP Daarul Aitam Palembang[7], as well as the

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[1] M. Holil, "Pendekatan Saintifik Dalam Pembelajaran Pendidikan Agama Islam Melaui Discovery Learning, Problem Based Learning, Dan Project Based Learning," *LISAN AL-HAL: Jurnal Pengembangan Pemikiran dan Kebudayaan* 17, no. 1 (2023): 124–38, https://doi.org/10.35316/lisanalhal.v17i1.124-138.

[2] Sarini Musyafi'ah Ali dan Kartini Ponengoh, "Optimalisasi Pendekatan Scientific dalam Pembelajaran Pendidikan Agama Islam," *Tafhim Al-'Ilmi*, 2020, 201–22.

[3] Ali dan Ponengoh.

[4] Asep Sunarko dan Agus Maulana Firdaus, "Pendekatan Saintifik Dalam Pengembangan Metode Dan Strategi Pembelajaran Agama Islam Di Indonesia," *Citizen : Jurnal Ilmiah Multidisiplin Indonesia* 1, no. 2 (2021): 68–74, https://doi.org/10.53866/jimi.v1i2.10.

[5] Sandra Dewi, "Pendekatan Saintifik dalam Peningkatan Keaktifan Siswa pada Pembelajaran Agama Islam di SMA," *DAYAH: Journal of Islamic Education* 2, no. 1 (2019): 212–29, https://doi.org/10.22373/jie.v1i1.2430.

[6] M Sony, "Analisis Implementasi Pendekatan Pembelajaran Saintifik Dalam Pembelajaran Pendidikan Agama Islam Di Sd Al Wathoniyah 09 Penggilingan Jakarta," *Jurnal Tarbiyah Jamiat Kheir* 1, no. 2 (2023): 143–60.

[7] Faisal, Aida Imtihana, dan Wasilah, "Penerapan Pendekatan Saintifik dan Penilaian Autentik Dalam Pembelajaran PAI di SMP Daarul Aitam Palembang," *Sinar Dunia: Jurnal Riset Sosial Humaniora dan Ilmu Pendidikan* 1, no. 3 (2022): 98–106, https://doi.org/10.58192/sidu.v1i3.310.

implementation of scientific approaches in PAI learning during the covid-19 pandemic at SMAN 1 Kuripan, West Lombok[8].

From a variety of previous studies, there are several differences between one research and another, such as the focus of research on variations in education levels (elementary, junior high, high school), the advancement of Islamic religious learning methods or discussions in the assessment of different aspects. However, the essence of the research remains the same, namely to improve the quality of PAI learning through more effective methods and strategies. This article aims to summarize and systematically analyze several studies on the application of a scientific approach in PAI learning, then find out the impact of its implementation on improving learning achievement and student learning interest, as well as identify challenges and opportunities faced in the future.

This study uses a (mini) systematic literature review approach, which is the process of identifying, assessing, and analyzing all existing research data to provide appropriate answers to specific research questions[9]. To evaluate the implementation of a scientific approach in learning Islamic Religious Education, the researcher collected 20 scholarly articles obtained through the Publish or Perish application, with selection criteria including topic relevance, clear methodology, and research results that can provide insights into the effectiveness of the scientific approach. The selected articles were then analyzed to identify key findings related to the impact of implementing this approach in Islamic religious education, as well as potential challenges or gaps that need to be addressed. The results of this analysis are expected to provide a clear understanding of the effectiveness of applying the scientific approach in the context of Islamic religious education.

Results and Discussion

The development of science and technology has brought significant changes in the aspect of education. In the context of Islamic religious learning, the traditional approach has begun to be replaced by more modern and interactive methods. One approach that is becoming increasingly popular is the scientific approach. In this discussion, it is known that a scientific approach can be applied in Islamic religious learning, starting from the learning planning stage to the assessment of learning outcomes. Then there is the impact of the implementation of the scientific approach on improving student learning achievement, learning interest, and the advancement of critical thinking skills, as well as identifying the challenges and opportunities encountered in applying the scientific approach in the context of Islamic religious learning in Indonesia.

A. The Use of Scientific Approach in Islamic Religious Education (PAI) Learning

In this discussion, a scientific approach can help students practice critical thinking skills, analytical, and encourage them to be more active and creative in the learning process. Various studies have shown that the implementation of the scientific approach in PAI provides significant benefits for student development, such as learning that can be done by utilizing technological media, then students wiil not just gain knowledge, but also form their attitudes and skills that are relevant to Islamic religious values, and students are not only taught to receive information clearly, but they are invited to understand and verify the information with more critical and in-depth thinking. In other studies, the scientific approach will be very effective in teaching only a few subjects, while the rest of the meals need to be adjusted to be more in line with the nature of the material, which is transcendent and believable. This can be assisted by the creation of special modules or other supports so that learning can run

[8] Muhammad Yuslih dan Paida, "Penerapan Pendekatan Saintifik Dalam Pembelajaran PAI di Masa Pandemi Covid-19 di SMAN 1 Kuripan Lombok Barat," *Ma'alim: Jurnal Pendidikan Islam* 2, no. 2 (2021): 161–83, https://doi.org/10.24235/al.ibtida.snj.v3i1.590.

[9] Olaf Zawacki-Richter dkk., *Systematic Reviews in Educational Research: Methodology, Perspectives and Application* (Springer Fachmedien Wiesbaden, 2019).

effectively. The following is a presentation of several scientific approaches related to Islamic religious education.

Table 1:

Researcher and Year	Journal	Heading	Research Results
Dewis Abdul, Muh. Arif (2020)	Al-Bahtsu	The Utilization of Digital Media in PAI Learning Through a Scientific Approach	This study demonstrates that digital media is not a medium that relies on manual human labor, but instead utilizes machines, such as computers. In addition to the media, a learning approach is also necessary, one of which is the scientific approach. These two elements can be integrated to achieve effective learning.[10].
Wildani Kushuma Auliya (2022)	At-Ta'dib: Scientific Journal of Islamic Religious Education Study Program	Integration of Scientific Approaches Through 21st Century Proficiency Models in Islamic Religious Education Learning	This article outlines the research findings that the integration of the scientific approach with the 21st-century proficiency model is achieved through several stages, which include: observing and questioning with critical thinking, gathering information collaboratively and creatively, reasoning through three aspects, and interpreting in a communicative manner. The learning process involves activities such as reading various references, watching videos, practicing religious activities, and engaging in classroom discussions.[11].
Sarini Musyafi'ah Ali, Kartini Ponengoh (2020)	Tafhim Al-'Ilmi	Optimization of Scientific Approaches in Islamic Religious Education Learning	This research reveals that the scientific approach touches 3 domains of education, namely; cognitive, affective and psychomotor. The learning steps with this scientific approach include observation, questioning, experimentation, reasoning, conclusion and communication[12].
Asep Sunarko, Agus Maulana Firdaus (2021)	Citizen: Indonesian Multidisciplinary Scientific Journal	Scientific Approach in the Development of Islamic	This article explains that the scientific approach encourages students to actively construct concepts, laws, or principles through stages such as

[10] Dewis Abdul dan Muh. Arif, "Pemanfaatan Media Digital dalam Pembelajaran PAI Melalui Pendekatan Saintifik," *Al-Bahtsu* 5, no. 2 (2020): 76–81.

[11] Wildani Kushumah Auliya, "Integrasi Pendekatan Saintifik Melalui Model Pendidikan Agama Islam" 14, no. 1 (2022): 48–60.

[12] Ali dan Ponengoh, "Optimalisasi Pendekatan Scientific dalam Pembelajaran Pendidikan Agama Islam."

		Religious Learning Methods and Strategies in Indonesia	observing (to identify or find problems), formulating questions, proposing or creating hypotheses, collecting data using various techniques, analyzing data, drawing conclusions, and communicating the discovered concepts, laws, or principles. The methods and strategies for teaching Islamic religion using a scientific approach encourage both teachers and students to think critically and apply deep reasoning, enabling them to develop a strong religious understanding and avoid falling into blind imitation (taqlid)[13].
Miftakhul Rohman, Muh. Mirwan Hariri, Fuad Ngainul Yaqin, Farah Nurul Nabila, Lailatul Fauzizah (2022)	SINDA: Comprehensive Journal of Islamic Social Studies	Scientific *Approach* in Learning Islamic Religious Education and Ethics Independent Learning Curriculum at SDN Ngadirejo 1 Blitar City	The study's findings reveal that the scientific approach in the Independent Learning curriculum is implemented through the 5M stages: observing, questioning, reasoning, connecting, and communicating. This approach is also in line with the positivistic paradigm, making it highly suitable and effective for subjects such as Fiqh, Morals, Al-Quran Hadith, and Islamic Cultural History. However, in the case of Aqidah, this scientific approach is considered less applicable.[14].
Miftakhul Rohman, Ashharul Muttaqin (2022)	SINDA: Comprehensive Journal of Islamic Social Studies	The Effectiveness of *a Scientific Approach* to PAI Materials on Independent Learning	The findings of this research indicate that the scientific approach in the Independent Learning curriculum is reflected through the stages of the scientific method. This approach is highly relevant and suitable when applied within the framework of the Independent Learning curriculum using a positivistic paradigm. However, certain aspects, such as teachings on faith and monotheism, are less aligned with this approach in Islamic Religious Education and Ethics. As a result, the scientific approach is primarily implemented in the teaching of Fiqh,

[13] Sunarko dan Firdaus, "Pendekatan Saintifik Dalam Pengembangan Metode Dan Strategi Pembelajaran Agama Islam Di Indonesia."

[14] Miftakhul Rohman dkk., "Pendekatan Ilmiah (Scientific Approach) Dalam Pembelajaran Pendidikan Agama Islam Dan Budi Pekerti Kurikulum Merdeka Belajar Di Sdn Ngadirejo 1 Kota Blitar," *SINDA: Comprehensive Journal of Islamic Social Studies* 2, no. 3 (2022): 106–17, https://doi.org/10.28926/sinda.v2i3.692.

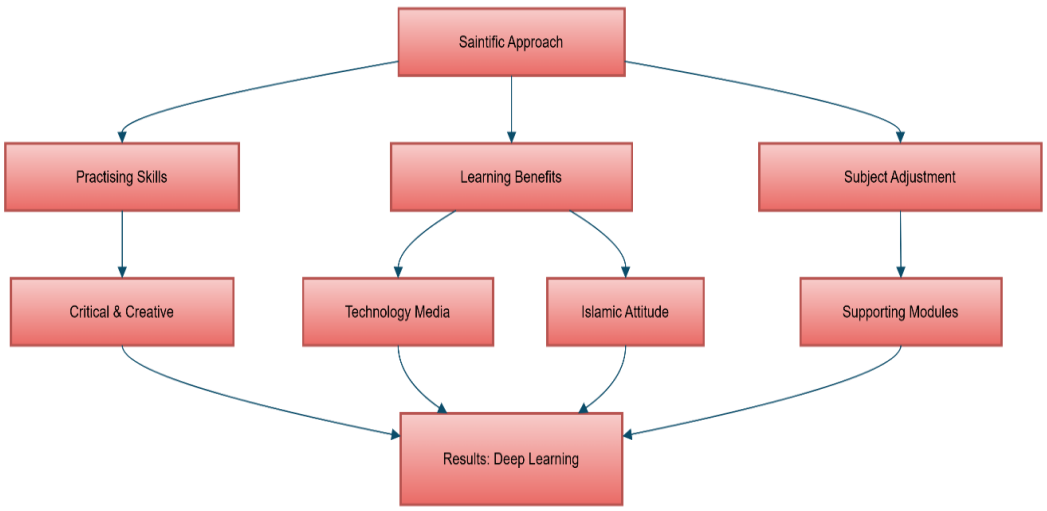
			morals, the Qur'an, Hadith, and Islamic cultural history[15].
Mayang Wahyu Widyandini (2021)	Thesis: IAIN Ponorogo	Implementation of the Scientific Approach of the 2013 Curriculum Revision and Improvement of Higher Level Thinking in the Subject of Islamic Religious Education and Ethics at SMAN 2 Ponorogo	The findings of this article are known that: 1) The scientific approach planning team and HOTS at SMA Negeri 2 Ponorogo has carried out operational management; functional and material. The school has developed several aspects, namely the purpose of the program, personnel, budget, time, and evaluation, and the right alternatives to deal with obstacles in the implementation of the program. 2) The implementation of scientific approaches and HOTS has been well carried out. Educators have applied a scientific approach with the 5M step, which conveys the material in a sequence starting from the LOTS stage to the HOTS stage. 3) Process evaluation is able to make students not only think up to the stage of factual, conceptual, and procedural knowledge but also at the stage of metacognitive knowledge. The evaluation of the final results of the scientific approach and HOTS was considered effective in applying at SMA Negeri 2 Ponorogo which succeeded in improving students' cognitive knowledge so that the assessment of student learning outcomes also increased[16].
Farha Qonita, Anwar Sa'dullah, Adi Sudrajat (2021)	Vicratina: Journal of Islamic Education	Implementation of a Scientific Approach to Religious Education and Ethics Subjects in the Covid-19 Pandemic Era at SMAN 8 Malang City	The outcomes of this article's research say that the stages of learning with a scientific approach during Covid-19 cannot run optimally due to the obstacles faced; limited interaction and unstable internet networks. However, the results obtained in learning using a scientific approach are known that; Students' critical attitude and quick response increased, observation activities were carried out by reading,

[15] Miftakhul Rohman dan Asyharul Muttaqin, "Efektivitas Scientific Approach terhadap Materi PAI pada Merdeka Belajar," *SINDA: Comprehensive Journal of Islamic Social Studies* 2, no. 1 (2022): 74–80, https://doi.org/10.28926/sinda.v2i1.503.

[16] Mayang Wahyu Widyandini, "Implementasi Pendekatan Saintifik Kurikulum 2013 Revisi dan Peningkatan Berpikir Tingkat Tinggi pada Mata Pelajaran Pendidikan Agama Islam dan Budi Pekerti di SMAN 2 Ponorogo PONOROGO" (IAIN Ponorogo, 2021).

			listening to presentations, videos, pictures, and events that occurred in society that were relevant to the learning material. In the activity of asking about the level of activity of students is greater during face-to-face learning than online learning, the activity of collecting information collected from books, websites and blogs in a certain period of time. As for practical activities, students conduct trials at home. The fourth stage is association carried out by students in the form of making conclusions about objects that have been observed and closed by communicating the results of knowledge or findings[17].
Nurhasanah (2019)	El-Hekam Journal	Development of the Moral Beliefs Module with a Scientific Approach for Min Students	This study develops a learning module for Aqidah Akhlak using a scientifically valid and practical approach. The validity test results yielded a score of 89%, indicating it is highly valid, while the practicality test achieved a score of 92%, classifying it as very practical. This means the module is both easy for teachers and students to use and understand. Therefore, this module is deemed appropriate for teaching Aqidah Akhlak in schools[18].

Overall, this table provides an overview that:



[17] Farha Qonita, Anwar Sa'dullah, dan Adi Sudrajat, "Implementasi Pendekatan Saintifik pada Mata Pelajaran Pendidikan Agama dan Budi pekerti Era Pandemi COVID-19 di SMA Negeri 8 Kota Malang," *Jurnal Pendidikan Islam* 4 (2019): 23–29.

[18] Nurhasanah Nurhasanah, "Pengembangan Modul Akidah Akhlak Dengan Pendekatan Saintifik Untuk Siswa Min," *El-Hekam* 4, no. 2 (2020): 189, https://doi.org/10.31958/jeh.v4i2.2018.

The scientific approach in Islamic Religious Education learning can be applied in a variety of ways and in various contexts, ranging from the use of digital media, integration with 21st century proficiency, to the emphasis on cognitive, affective, and psychomotor development of students. The studies presented in this table show the effectiveness of the scientific approach in improving the quality of PAI learning, although some challenges or gaps also need to be considered.

B. The Use of Scientific Approach to Improve Student Learning Achievement and Interest

The scientific approach in learning has become one of the methods that is widely applied to enhance student learning outcomes and interests, especially in the subject of Islamic Religious Education. This approach prioritizes the scientific thinking process through steps such as observing, questioning, gathering information, associating, analyzing, reasoning, then inferring and creating[19]. Various studies have shown that the implementation of a scientific approach can improve students' understanding of subject matter as well as form better critical thinking characters and skills[20]. The results of published research show that the implementation of this approach is not only effective in improving students' learning achievement, but can also motivate them to be more active and interested in lessons. For example, some of the studies presented in table 2 show an increase in student achievement and interest in learning after the implementation of a scientific approach in PAI learning in various schools. The following are studies that are evidence and illustrations that the scientific approach has great potential to be used in creating a more dynamic and effective learning atmosphere at the primary to secondary education levels.

Table 2:

Researcher and Year	Journal	Heading	Research Results
Muhammad Ansori (2020)	Al Qodiri: Journal of Education, Social and Religious Affairs	The Influence of Scientific Approach on Student Learning Achievement in Islamic Religious Education Subjects	This study demonstrates that the application of the scientific approach at Elementary and Junior High School Plus Al-Qodiri is highly effective, with a percentage score of 81.33%. The students' performance in Islamic Religious Education has shown significant improvement, with a score of 70.67%, placing it in the good category. The impact of the scientific approach (variable X) on student achievement in Islamic Religious Education (variable Y) is 96.04%, while the remaining 3.96% is attributed to other factors[21].

[19] Komang Suparsawan, *Kolaborasi Pendekatan Saintifik Dengan Model Pembelajaran Stad Geliatkan Peserta Didik* (Bandung: Tata Akbar, 2020).

[20] Dina Liana, "Berpikir Kritis melalui Pendekatan Saintifik," *Mitra PGMI* 6, no. 1 (2020): 15–27, https://doi.org/10.46963/mpgmi.v6i1.92.

[21] Muhamad Ansori, "Pengaruh Pendekatan Saintifik Terhadap Prestasibelajar Siswapada Mata Pelajaran Pendidikan Agama Islam," *Al Qodiri: Jurnal Pendidikan, Sosial dan Keagamaan* 18, no. 1 (2020): 100.

Sedya Santosa, Badratun Nafis (2021)	Educational: Journal of Educational Sciences	Analysis of Scientific Learning in Islamic Education	The findings highlighted a scientific approach that includes observing, questioning, gathering information, associating, and communicating. When this scientific method is incorporated into Islamic education for character development, students can cultivate character values within themselves through their immediate surroundings, such as family, school, and the community. To instill these character values, it is important to foster learning habits and role models that support the development of the desired character traits in students[22].
Arif Mahfud (2020)	G-COUNS: Journal of Guidance and Counseling	Comparison of the Implementation of Scientific Learning in Islamic Religious Education (PAI) Subjects in Strengthening Religious Awareness in Visually Impaired Students at Slb Pembina Yogyakarta and Slb Muhammadiyah Gamping	This study examines the application of scientific learning in PAI education for students with disabilities at SLB Negeri Pembina Yogyakarta and SLB Muhammadiyah Gamping. The findings revealed that the PAI subjects covered included faith and morals, successfully enhancing students' religious activities at both schools. The teaching strategies were tailored to address the challenges and supporting factors present in each school[23].
Vanda Rezania, Muhlasin Amrullah, Nurfi Laili, Nikmatul Alfiyah (2020)	Paedagoria: Journal of Studies, Research and Development Educational	Integration of Islam and Science in Primary School Learning as the Foundation of the Industrial Revolution 4.0	This study highlights the significance of merging Islamic values with scientific concepts in education to address the challenges of the Industrial Revolution 4.0. The findings indicate that fostering religious values and implementing discovery-based learning can assist elementary school students in developing independent learning

[22] Sedya Santosa dan Badratun Nafis, "Analisis Pembelajaran Saintifik dalam Pendidikan Islam," *Edukatif : Jurnal Ilmu Pendidikan* 3, no. 6 (2021): 4995–5004, https://doi.org/10.31004/edukatif.v3i6.1577.

[23] Arif Mahfud, "Perbandingan Implementasi Scientific Learning Pada Mata Pelajaran Pendidikan Agama Islam (Pai) Dalam Penguatan Kesadaran Beragama Pada Siswa Tunagrahita Di Slb Pembina Yogyakarta Dengan Slb Muhammadiyah Gamping," *G-Couns: Jurnal Bimbingan dan Konseling* 4, no. 2 (2020): 249–60, https://doi.org/10.31316/g.couns.v4i2.810.

			skills, which serve as a foundation for making the most of advancements in educational technology[24].
Goddess Arina (2021)	Skula : Journal of Madrasah Teacher Professional Education	Development of Moral Faith Learning Tools with a Scientific Approach to Improve the Creative Thinking Ability of MI Students	This research develops a learning tool for Akidah Akhlak with a scientific approach, which emphasizes discovery-based learning, experimentation, and critical thinking. The developed tools have proven to be valid and effective in improving learning activities and students' creative thinking skills, so that they can be used by teachers to support a more interactive learning process and based on a scientific approach[25].
Siti Umdlotul Khoiroh Siti Umdlotul Khoiroh, during Ibn Waqfin, Hidayatur Rohmah (2020)	JoEMS: Journal of Education Journal of Education and Management Studies and Management Studies	The Influence of Scientific Approach with Discovery Learning Model on Student Learning Outcomes in Fiqh Lessons Class VII Mts Rahmat Said Bongkot	This study shows that the Discovery Learning learning model applied with a scientific approach has a positive effect on the learning outcomes of Fiqh students at MTs Rahmat Said. The results showed excellent learning implementation (85%), excellent student response (81.5%), and high test results (75%). The hypothesis test shows that this model is effective in improving student learning outcomes through a scientific approach that encourages students to be active in the learning process[26].
Sukria Hairun Nisa, Diva Sri Wahyuni Ahmad, Jahro Muniro (2023)	J Kitabah: Social Education of the Humanities	Scientific Approach in Improving the Learning Outcomes of Islamic Religious Education for Grade VII Students of SMP	This study investigates the application of a scientific approach to enhance the learning achievements of Islamic Religious Education in grade VII at SMP Muhammadiyah 7 Medan. The findings indicate that the scientific approach, consisting of five stages (observing, questioning, exploring, reasoning, and communicating), has been successfully applied. The

[24] Vanda Rezania dkk., "Integrasi Islam dan Saintifik dalam Pembelajaran Sekolah Dasar sebagai Pondasi Revolusi Industrti 4.0," *Paedagoria :Jurnal Kajian, Penelitian dan Pengembangan Kependidikan* Volume 11, no. 2 (2020): 188–94.

[25] Dewi Arina, "Pengembangan Perangkat Pembelajaran Akidah Akhlak Dengan Pendekatan Saintifik Untuk Meningkatkan Kemampuan Berpikir Kreatif Siswa MI," *SKULA: Jurnal Pendidikan Profesi Guru Madrasah* 1, no. 1 (2021): 31–38.

[26] Siti Umdlotul Khoiroh, Saat Ibnu Waqfin, dan Hidayatur R Ohmah, "Pengaruh Pendekatan Saintifik Dengan Model Discovery Learning Terhadap Hasil Belajar Siswa Pada Pelajaran Fiqih Kelas VII MTs Rahmat Said Bongkot," *Journal of Educatio n and Management Studies* 3, no. 3 (2020): 43–48.

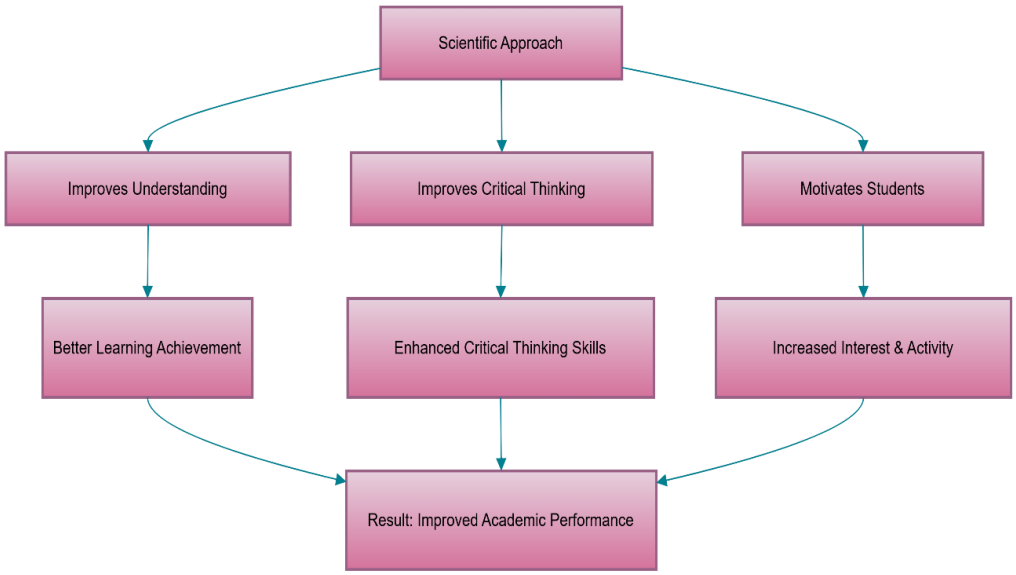
		Muhammadiyah 7 Medan	implementation of this approach has proven effective in enhacing students' learning outcomes in Islamic Religious Education at the school[27].
M. Rizki Lazuardi, Zulhaini (2020)	JOM FTK UNIKS	Teachers' Efforts in the Implementation of a Scientific Approach in the Field of Islamic Religious Education and Ethics for Grade XII Students at SMA Negeri 1 Teluk Kuantan	This study highlights that teachers at SMA Negeri 1 Teluk Kuantan have effectively applied a scientific approach in teaching Islamic Religious Education and Ethics. The teachers' efforts involve encouraging students to ask questions, providing examples to aid comprehension, and offering illustrations to help students better grasp the material and experiments[28].
Abdul Malika, St Nur Aisyaha, Akhmad Syahida, Ansar, (2023)	JIIR: Islamic Resources Scientific Journal	Implementation of Scientific Approach to Improve Learning Performance in Islamic Religious Education and Students' Ethics	This study explores the enhancement of student performance in Islamic Religious Education and Ethics through the use of a scientific approach. The results demonstrated a notable improvement, with the average score rising from 59 in the pre-cycle to 75 in Cycle I, and reaching 92 in Cycle II. The application of the scientific approach has been shown to be effective in boosting student learning outcomes[29].

[27] Sukria Hairun Nisa, Diva Sri Wahyuni Ahmad, dan Jahro Muniro, "Pendekatan Saintifik Dalam Meningkatkan Hasil Belajar Pendidikan Agama Islam Terhadap Siswa Kelas VII SMP Muhammadiyah 7 Medan Sukria," *Kitabah: Jurnal Pendidikan Sosial Humaniora* 1, no. 3 (2023): 180–97.

[28] M Rizki Lazuardi dan Zulhaini, "Upaya Guru Dalam Implementasi Pendekatan Saintifik Pada Bidang Studi Pendidikan Agama Islam dan Budi Pekerti Siswa Kelas XII di SMA Negeri 1 Teluk Kuantan" 1, no. 2 (2020): 323–31.

[29] Abdul Malik dkk., "Penerapan Pendekatan Saintifik Untuk Meningkatkan Prestasi Belajar Pada Mata Pelajaran Pendidikan Agama Islam Dan Budi Pekerti Peserta Didik," *Jurnal Ilmiah Islamic Resources* 20, no. 1 (2023): 51–57.

Comprehensively, this table provides an overview that:



This provides a clear picture that the scientific approach not only focuses on mastering the subject matter, but also on improving students' critical thinking skills and interest in learning. This shows that a scientific approach can be an effective tool in achieving better learning goals in the context of Islamic Religious Education.

C. Challenges and Opportunities in the Implementation of Scientific Approaches

1. Challenges in the Implementation of Scientific Approaches in PAI Learning in Indonesia

Here are 2 challenges faced by teachers in implementing a scientific approach to PAI learning, namely:

a. Lack of Relevant Learning Resources[30]

The scientific approach emphasizes the use of relevant and evidence-based learning resources. However, in PAI learning, teaching materials that are in accordance with this approach are not always available, either in the form of materials, modules, or resources related to the existing context. Therefore, teachers must think creatively and make innovations in learning, and this is the challenge for them.

Regarding the scarcity of relevant learning resources, the development of teaching materials that align with the scientific approach in Islamic Religious Education (PAI) becomes essential. Therefore, it is necessary to utilize available resources, such as textbooks, scholarly articles, and digital resources related to science and technology, to create content that integrates religious teachings and the scientific approach.[31]

The development of teaching materials based on experiments, case studies, or simulations that can illustrate the relationship between Islamic values and scientific knowledge is an effective solution.[32] For example, material that connects scientific concepts with Islamic teachings about the creation of the universe can be presented in a more interactive and data-driven format. In addition, the use of technology, such as

[30] Asnil Aidah Ritonga, "Scientific Approach to Religious Education Learning in Integrated Islamic Elementary Schools," *MIQOT* 41, no. 1 (2017).

[31] Arbain Nurdin, "Inovasi pembelajaran pendidikan agama islam di era information and communication Technology," *TADRIS: Jurnal Pendidikan Islam* 11, no. 1 (2016): 49–64.

[32] Ahyar Rasyidi, "Pendidikan Agama Islam dan Peningkatan Keterampilan Berpikir Kritis sebagai pengembang pemahaman serta pengamalan ajaran Islam kehidupan sehari-hari," *Islamic Education Review* 1, no. 1 (2024): 1–21.

virtual or augmented reality-based applications, can also enhance the appeal and effectiveness of teaching materials in conveying scientific concepts within the context of Islamic Religious Education.[33]

Despite the limitations in resources, creativity in developing teaching materials that align with the scientific approach can make a significant contribution to improving the quality of Islamic Religious Education teaching and support the creation of a more holistic learning experience.

b. Lack of Teacher Skills in Scientific Approach

Islamic Religious Education teachers are often not trained to apply scientific methods in learning. They are not yet familiar with the research, experiment, or data-driven learning techniques that are at the core of the scientific approach. Many teachers still face some problems in teaching. They have not fully understood the scientific approach that should be used in learning. Teachers also have difficulty conveying material in a way that is easy for students to understand and often have difficulty finding misunderstandings that occur to students. In addition, they find it difficult to manage classes, manage time, and monitor the course of learning. Some teachers still use traditional teaching methods that focus more on teachers, rather than involving students actively in the learning process[34].

To address the issue of teachers' skill deficiencies in implementing the scientific approach, several training strategies can be applied.

1) Practice-based training with a collaborative approach, such as project-based learning, can enhance teachers' skills through real activities that involve scientific experiments.
2) Training in the use of technology in teaching, such as scientific simulation applications, will enrich the learning experience for both teachers and students.[35]
3) Mentoring and professional coaching programs can also assist less experienced teachers through guidance from senior teachers.[36]
4) Ongoing training through webinars and seminars will ensure that teachers stay updated on the latest developments in science and methodology.[37]
5) The development of curriculum-based scientific training modules and strengthening student-centered active learning is also crucial for increasing student engagement and scientific understanding.[38]

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[33] Anggela Pratama, Najril Moch, dan Namira Khosyi, "Towards technology-based education: Exploration of augmented reality in e-modules for latest learning," *Hipkin Journal of Educational Research* 1, no. 3 (2024): 351–62.

[34] Manik Nur Haq dan Mukhamad Murdiono, "Problematika guru dalam penerapan pendekatan saintifik pada pembelajaran PPKn," *Jurnal Civics: Media Kajian Kewarganegaraan* 16, no. 2 (2019): 165–76, https://doi.org/10.21831/jc.v16i2.24603.

[35] Muhammad Agus Umar, "Penerapan Pendekatan Saintifik dengan Metode Pembelajaran Berbasis Proyek (Project-Based Learning) dalam Materi Ekologi," *Bionatural: Jurnal Ilmiah Pendidikan Biologi* 4, no. 2 (2018), https://scholar.archive.org/work/2caqpc7hsnh45nzko3rooh45du/access/wayback/http://ejournal.stkipbbm.ac.id/index.php/bio/article/viewFile/277/233.

[36] Nehtry Merukh dan Bambang Suteng Sulasmono, "Pengembangan Model Supervisi Akademik Teknik Mentoring Bagi Pembinaan Kompetensi Pedagogik Guru Kelas," *Kelola: Jurnal Manajemen Pendidikan* 3, no. 1 (2016): 30–48.

[37] Acep Samsudin dkk., "Pengaruh Pendidikan dan Pelatihan terhadap Kinerja Guru," *El-Mujtama: Jurnal Pengabdian Masyarakat* 4, no. 3 (2024): 1309–16.

[38] M. Pd Kustiarini dkk., *Inovasi Pembelajaran Berbasis Literasi Sains Mendukung Penguatan Life Skills Siswa SD/MI* (Cahya Ghani Recovery, 2024), https://books.google.com/books?hl=en&lr=&id=0ukjEQAAQBAJ&oi=fnd&pg=PA6&dq=Penyusunan+modul+pelatihan+berbasis+kurikulum+ilmiah+dan+penguatan+pembelajaran+aktif+berbasis+siswa+juga+sangat+penting+untuk+meningkatkan+keterlibatan+siswa+dan+pemahaman+ilmiah.&ots=_q8nIUgfHo&sig=kHu2Lzd7m4jgszIub7aiQQv8NRA.

6) Regular evaluation and feedback will ensure that the skills learned can be effectively applied in the field. With this approach, teachers will be better prepared to face challenges in teaching scientific concepts and improve the quality of education.

The implementation of a scientific approach requires a change in the perspective and more modern skills of teachers in order to run effectively, supported by teaching materials that are more relevant and easily accessible.

2. Opportunities in the Implementation of Scientific Approaches in PAI Learning in Indonesia

The implementation of this scientific approach in modern times certainly provides more flexible and practical opportunities and access. When the study of Islam is combined with a scientific context, it will be easier for Muslims to understand and apply religious teachings in their daily lives in a more rational and empirical evidence-based way. Here are 2 significant opportunities that can be of concern for educators to be used as one of the focuses of development in Islamic religious education in the modern era:

a. Utilization of Technology

Various studies have shown that technology is very helpful and makes it easier for people to access science. In the digital era, access to Islamic religious materials is increasingly widespread thanks to educational applications, websites, and online platforms[39]. These various apps can be downloaded through *gadgets* or even just through online *website* visits. From this application or website, students can access the information needed based on data and research, such as Qur'an interpretation, sahih hadith, fiqh, Islamic history, and other knowledge about various contemporary issues relevant to Islamic teachings. In addition, students can also access a variety of online courses, learning videos and articles that discuss important issues in religion.

b. Cross-Disciplinary Collaboration

The Scientific Approach in learning PAI can be related to other social sciences that are relevant to daily life, because this approach involves systematic steps such as observation, experimentation, and analysis to obtain objective answers to what is learned. With this approach, a rational and evidence-based understanding of religion can prevent students from understanding or issues that are prevalent in society such as radicalism[40], socio-political issues or even other extreme things.

Conclusion

The scientific approach focuses on improving students' critical thinking, analytical skills, and active involvement in the learning process. Various studies show that the implementation of a scientific approach in learning Islamic Religious Education (PAI) can enrich students' understanding of the material, improve learning achievement, and form attitudes and skills in accordance with Islamic religious values. However, the success of the implementation of this approach also depends on the adjustment of teaching materials and teachers' skills in managing scientific-based learning.

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[39] Sukana, "Transformasi Pengawas Pendidikan Agama Islam (PAI) di Era Digital : Tantangan dan Peluang Tahun 2024," *Jurnal Pendidikan Tambusai* 8, no. 1 (2024): 3955–65.

[40] H Khalis, "Kearifan Lokal Dan Radikalisme: Memperkuat Pembelajaran Pai Melalui Scientific Learning," *Jurnal Islam Nusantara* 03, no. 01 (2019): 287–306.

In addition to its benefits in improving the quality of learning, a scientific approach can also boost students' interest and motivation to learn more actively. Through stages such as observing, asking questions, collecting information, reasoning, and communicating, students are invited to think critically and develop a deeper understanding of Islamic teachings. Research shows that the use of this approach is effective in increasing students' understanding of subject matter, both in cognitive, affective, and psychomotor aspects.

The challenges faced in the implementation of the scientific approach, such as the limitation of relevant learning resources and the lack of teacher skills, need to be overcome so that the learning process can take place more effectively. In addition to challenges, the implementation of a scientific approach in Islamic religious education also offers various opportunities, especially in utilizing technology to expand access to learning. Then, this approach opens up opportunities for cross-disciplinary collaboration, which allows students to understand Islam in a more rational and evidence-based way.

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