SCIENTIST PARENTAL APPLICATION: PRESERVING THE LEGACY OF PROGRESSIVE SCIENTIFIC ETHICS

Mardianto[1]
Ahmad Darlis[2]

[1,2] Universitas Islam Negeri Sumatera Utara
mardianto@uinsu.ac.id
ahmaddarlis@uinsu.ac.id

Abstract: *Science is a product of human endeavor that facilitates the management, resolution, and planning of life's complexities. It is derived through a process of contemplation, logical reasoning, empirical research, and constructive dialogue. While past scholars have provided a profound legacy—further validated by contemporary research—this knowledge must be advanced to shape the future. Furthermore, a scientist's role is inherently intertwined with the ethics of how knowledge is articulated and transmitted. In the modern era, knowledge is accessible through a multitude of sources, ranging from classical scholarly works to various digital platforms and streamlined applications. However, the humanistic connection between scholars has diminished, nearly eroding the traditional process of intellectual inheritance. This poses a significant ethical challenge; yet, maintaining the 'parental' mentorship process remains an absolute necessity. Consequently, a 'Scientist Parental Application' emerges as a solution to preserve an ethically-grounded intellectual legacy for a progressive future.*

Keywords: *Application, Scientist Parental, Legacy, Scientific Ethics*

Introduction

Science is a human endeavor that facilitates the resolution, management, and planning of life's complexities. In Islam, knowledge is attained through three fundamental elements: the senses, reason, and the heart. In practice, these elements are implemented through distinct methodologies: the senses for the observational method (bayāni), reason for the logical or demonstrative method (burhāni), and the heart for the intuitive method (ʻirfāni). (Kosim, 2020, p. 95). Scholars of the past have bestowed a profound legacy, further validated by contemporary research and advanced to shape the future. Moreover, a scientist is inherently bound by the ethics of how knowledge is articulated and transmitted.

Scientists bear the responsibility not only to generate new findings but also to ensure that the knowledge derived from their research is effectively passed on to and understood by future generations (Prathapan, 2023). An awareness of the significance of this knowledge transition places ethical aspects at the forefront of education, where scientific outcomes must be viewed as integral components of a larger scholarly community. Consequently, the endeavor to maintain scientific validity is not merely an individual responsibility but a collective commitment to bequeathing an intellectual legacy to future generations (Politi, 2025, p. 2).

Through this process, scientists ensure that their knowledge does not dissipate, but is instead inherited by the next generation of young scholars who continuously develop and adapt it to contemporary challenges. Young scientists represent a powerful resource for change and sustainable development, as they drive innovation and knowledge creation. (Beadudry, Mouton, & Prozesky, 2018, p. 216).

Furthermore, in the process of transmitting knowledge and experience, scientists can leverage available technologies to reach a broader audience and expand the impact of their expertise. (Nay, Naqib, & Masruroh, 2025, p. 29). Factually, information technology products have become an essential part of the lifelong experience. The utilization of information technology occurs at various critical junctures in life, including education. Consequently, information technology has become an inseparable component of the educational landscape. (Korucu & Kabak, 2019, p. 19).

Through the utilization of digital tools and platforms, education has become more interactive and efficient. Furthermore, access to information and learning resources has become increasingly accessible, enabling individuals to engage in independent and flexible learning. These changes not only enhance the quality of education but also expand its reach to a broader audience; digital technology has fundamentally altered the educational landscape. (Beksultanova, O. Yu, & MA, 2020)

Such conditions necessitate that education adapts accordingly. (Rimatuzzahriah, Abrar, & Ibrahim, 2023, p. 100). Pendidikan Education must align itself with the continuous advancements of evolving digital technologies. This adaptation is crucial to ensure that the educational process remains relevant and effective in addressing the challenges of the modern era. By leveraging digital technology, education can enhance both accessibility and interactivity. Therefore, the integration of technology in education must become a priority to prepare a generation that is ready to compete in the digital age. As emphasized by Yumei; "*The integration of digital technologies into education represents a significant evolution in the pedagogical landscape, with the potential to enhance accessibility, engagement, and personalization in learning*". (Zou, Kuek, Feng, & Cheng, 2025, p. 1).

In this context, collaboration among scientists is paramount to creating an ecosystem that fosters intellectual development and innovation, while moving beyond traditional comfort zones. Technologists can provide insights into the latest tools and platforms applicable to the educational process, while educational experts offer perspectives on how such technologies can be implemented pedagogically to meet educational needs. Thus, synergy between these two disciplines is fundamental to establishing a holistic and progress-oriented educational system. This appears to be what Gündoğdu & Merç imply in their statement: "*As long as there is an appropriate use of pedagogical approach as well as pedagogically appropriate use of technology, technology is considered to enable collaborative creativity nurturing platform with wide range of tools*." (Gündoğdu & Merç, 2022, p. 77).

Based on the aforementioned rationalization, appropriate action is imperative. On one hand, technological advancements must be adaptively accommodated to ensure that educational systems and processes remain relevant and meet the demands of change. On the other hand, the preservation and cultivation of ethical values within the educational framework must be maintained and enhanced. Therefore, there is a fundamental need to balance these two aspects. Digital platforms and applications must be created, packaged, and developed with a spiritual touch and ethical values. This paper serves as a preliminary conceptual framework for the creation and development of a 'Scientist Parental Application' aimed at preserving the legacy of progressive scientific ethics.

Literature Review.

Scientist Parental Application.

The term application refers to software that is applicative in nature, meaning it can be executed directly via extensions, installed into an operating system, or run through online services. (Pratama, 2023, p. 5). Related terminology includes "apps" (an abbreviation for applications), programs, and application software. (Rusmanto, 2020, p. 20).

Meanwhile, the term parental generally pertains to upbringing, education, and maintenance. The term was first utilized in the field of biology within the context of genetics, where it refers to the progenitor or parent. (Andriyani, Triana, & Juliarti, 2015, p. 224). When applied to botany, "parental" denotes the parent plants that are mated or crossbred. (Vertygo, 2021, p. 78). According to The Comprehensive Dictionary of Indonesian (KBBI), parental is defined as a kinship system within a family that is characterized by or centered around the parents as the seat of authority.

In the context of the parent-child relationship, the term "parental" is synonymous with parenting. This term refers to the upbringing provided by parents, aimed at nurturing a child's physical, emotional, social, and intellectual development from infancy to adulthood. (Virasiri, Yunibhand, & Chaiyawat, 2011, p. 1110). Consequently, the term "parental" has evolved to encompass specific contexts and meanings. For instance, there is the concept of Parental Ethnotheories, introduced by Super and Harkness. (Yuniardi, 2022, p. 132). Parental Ethnotheories emphasize the significance of the psychological characteristics of parents or caregivers, including the beliefs and values they hold regarding child development. These ethnotheories influence a child's development, particularly through the determination of educational contexts and practices.

Another recognized term is Parental Burnout, pioneered by Isabelle Roskam. (Asa, 2023, p. 14). Parental Burnout is defined as the physical, emotional, and mental exhaustion experienced by parents as a result of continuous caregiving. Furthermore, there is the concept of Parental Resilience, which is understood as the capacity of parents to remain stable, resilient, and compassionate when facing significant challenges that could disrupt the overall stability and well-being of the family. (Hendriani, 2025, p. 54).

Based on the aforementioned descriptions, scientist parental in this context refers to the upbringing, guidance, maintenance, and the transmission of knowledge and ethics from established scientists to aspiring scientists of the next generation. The emphasis of this scientist parental concept lies in the continuity of the scientific chain from one scholar to the next, aimed at preserving the authenticity and integrity of the knowledge.

The fundamental concept of scientist parental is constructed based on the concept of knowledge transmission found in various Islamic academic disciplines. This transmission process refers to the methods of delivering and inheriting knowledge from one generation to the next, often involving deep interaction between the educator (‘alim, shaykh, kyai, ustadz) and the student within a tradition-rich academic environment. In Islamic scholarship, this approach encompasses not only the transfer of information but also the ethical values integral to the dissemination of knowledge itself. Consequently, education in this context serves not only to develop intellectual competence but also to cultivate positive character and a strong individual identity.

This transmission is referred to as the continuity of the scientific chain. In the science of Hadith, the term sanad literally means al-Mu’tamad, signifying a support or something to rely upon. Terminology-wise, it represents the lineage of narrators (isnad) that connects directly to the matn or the core material of the Hadith. (Thahhan, 2004, p. 19). This concept has evolved across other religious disciplines, based on the premise that all religious knowledge must ultimately trace back to its primary source, the Prophet Muhammad SAW. Consequently, this continuity requires rigorous validation. (Kharis, 2022, p. 16). Typically, the continuity of this scientific lineage is formalized and evidenced by an ijazah (certification of authorization) granted by the educator. (Chuzaemah, 2025, p. 16).

The substance of this sanad is the scientific lineage or chain that connects one generation to the next. Within this sanad, there is an inherent element of interconnection (muwāshalah), as a consequence of the process of receiving and transmitting knowledge (tahammul wal adā') (al-Khatib, 2006, p. 147). Each stage within the sanad is not merely the transmission of text, but rather an interaction that establishes the authenticity and credibility of the information delivered. Each individual within the chain holds a significant role in disseminating knowledge, reflecting a profound sense of academic responsibility.

The Scientist Parental Application is an innovation designed to facilitate the process of upbringing, maintenance, and the transmission of knowledge and ethics from established scientists to the next generation of aspiring scholars. Through an interactive, educational, and integrative approach, this application provides a platform for scientists to share the knowledge, experience, and skills necessitated by the academic world. In its functional implementation, the application does not merely focus on a unidirectional transfer of knowledge; instead, it prioritizes dialogue and collaboration between scientists and aspiring scholars as a form of continuity in the scientific chain.

Method

As a development process, the activities conducted herein involve a series of systematic stages, namely: planning, requirements analysis, system design, implementation, testing, distribution, and software maintenance (for the Scientist Parental Application). This cycle is illustrated in the following figure:

Figure 1. Software Development Life Cycle (SDLC) Cycle
Modified from: (Waseso et al., 2025)

To manage this process, a development methodology is employed to provide a structured framework and guiding principles. As a preliminary concept, the development of the Scientist Parental Application utilizes the Waterfall methodology. This approach emphasizes meticulous planning at the outset of the project, requiring each phase to be fully completed before proceeding to the next. (Waseso & dkk, 2025, p. 16).

The Waterfall methodology is illustrated as a river flowing over a series of cascades (Jones, 2016), resulting in a systematic and sequential workflow. (Prabowo, 2020, p. 38). It is characterized as sequential because each stage must await the completion of the preceding phase, advancing in a linear order. (Fathoroni & Dkk, 2020, p. 20).

This methodology is chosen due to the inherent complexity of the Scientist Parental Application to be developed. In practice, the process begins with a feasibility study of the application, followed by analysis and specification. The subsequent stage involves system design, followed by program coding and module testing. The next phase encompasses module integration and system testing. Finally, the process concludes with application maintenance. This workflow is illustrated in the following figure:

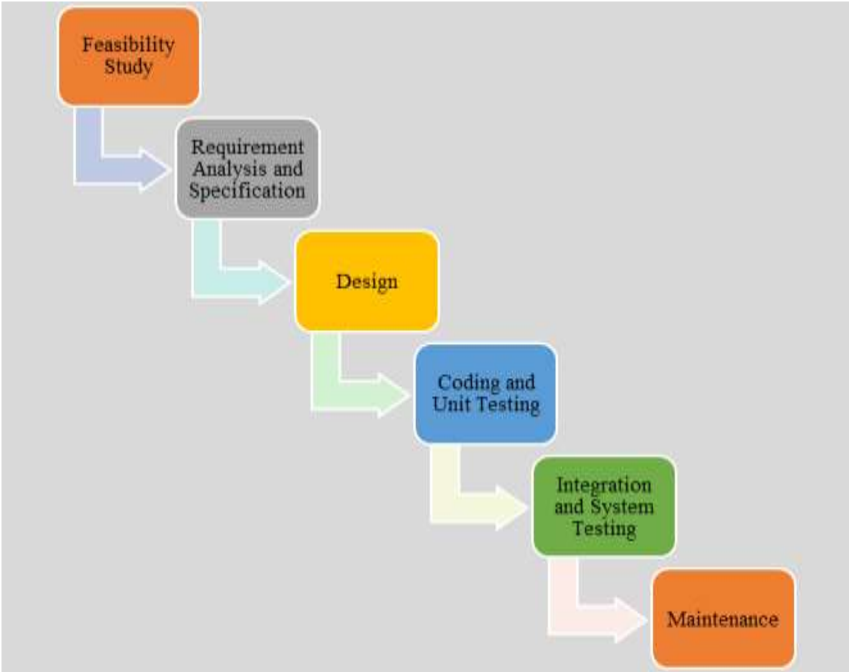

Figure 2. Development Workflow of the Scientist Parental Application.

Result and Discussion.

The Urgency of the Scientist Parental Application.

The urgency of the scientific chain (isnad) essentially originates from the tradition of Hadith scholarship, where the tracking of the sanad (chain of transmission) serves to validate the sayings of the Prophet, his companions, the tabi'in (successors), and so forth. This necessitates a clear and continuous lineage of knowledge in the process of transmitting the Prophetic Hadith. Consequently, scholars emphasize the vital importance of this scientific continuity. (HS, 2020, p. 108). Anyone intending to convey a Hadith must demonstrate the validity of its source, connected back to the Prophet. This connectivity determines the varying grades of Hadith authenticity, such as sahih (authentic), hasan (good), and da'if (weak) in their various forms.

In subsequent developments, the concept of sanad expanded into other fields of religious scholarship. (Bizawe, 2022, p. 21). Indeed, the scientific genealogy of society through a Muslim intellectual sanad is critical in maintaining accountable and authoritative religious knowledge. (Mustofa, 2020). Some authors employ the term genealogy to describe a broader scientific network. In this context, the term genealogy encompasses a wider scope than the concept of "knowledge transmission" itself.

The importance of this knowledge transmission demonstrates an individual's scholarly credibility, providing critical information that is not easily acquired. Furthermore, it clarifies the continuity between the educator and the original author of the text. The sanad serves as a guarantee that the knowledge obtained originates from the actual authorities of that discipline, ensuring it is not acquired haphazardly. (Hasan, 2023, p. 48).

Moreover, this transmission of knowledge ensures the originality and integrity of the science. It simultaneously fosters a comprehensive understanding of the context and scholarly ethics that cannot be replaced by even the most advanced search engine algorithms. (Mahmudah, 2025, p. 28). Therefore, the transmission of knowledge and the process of ijazah (certification) become essential and inherent components, carrying spiritual significance that provides legitimacy to the rights and authoritative validity of knowledge from generation to generation. (Burhanuddin, 2017, p. 5). The legitimacy of the scientific sanad not only strengthens the understanding acquired from a teacher but also serves as a link to the scientific continuity of preceding scholars. (Mahrussilah, 2022, p. 158).

The profound importance of the scientific sanad is underscored by several eminent scholars: Imam Shafi'i asserted that "there is no knowledge without sanad." Imam Al-Thawri remarked that "a seeker of knowledge without a sanad is like someone attempting to climb a roof without a ladder." Furthermore, Imam Malik emphasized, "do not carry knowledge learned from those whose scholarly background is unknown to you". (Bizawe, 2022, p. 20). These perspectives demonstrate that a breach in the scientific chain leads to the obscuring of originality and authenticity in knowledge, which ultimately risks the disintegration of civilization.

This is why Imam al-Nawawi emphasized: "Study knowledge from the experts before a time comes when a community speaks about knowledge based on mere prejudice, while they lack an accountable scholarly foundation". (al-Nawawi, 2018, p. 52). Without such a foundation, individuals lacking capability and integrity will emerge to speak in the public sphere. Religious disciplines, in particular, necessitate a scholarly basis for anyone speaking on behalf of religion. For without studying under the direct guidance of a teacher, one is not fit to claim status as a scholar, regardless of how many books they may have read. (Bizawe, 2022, p. 21).

The emergence of the Scientist Parental Application serves as a conceptual response to these contemporary and technological developments. In principle, this application aims to preserve the continuity of the scientific chain across generations of scholars, integrated with purposeful technological advancements. The directed use of technology is a pivotal aspect of this application, as it facilitates dynamic interaction and provides broader accessibility to scholarly resources.

The Development Process of the Scientist Parental Application.

The process of the Scientist parental application can be likened to the granting of a diploma, or *sanad*. Both involve the recognition and legitimation of acquired knowledge. Generally, there are two forms of the certification process: *ijazah 'amm* (general authorization) and *ijazah khass* (specific authorization) (Nurdin, Rahtikawati, & Rusmana, 2024, p. 301). A general authorization is granted to anyone participating in a study who is deemed permitted to teach the knowledge they have obtained. In contrast, a specific authorization is bestowed upon particular individuals regarded as highly proficient experts in the field. Such individuals are not only authorized to teach but also to transmit scholarly traditions to others.

Several practices exist regarding the granting of *ijazah*, one of which is known as *ijazah Musalsal bi al-Tasybik* (intertwined hand-clasping). In this procedure, each student clasps the hand of the educator, while simultaneously reciting a specific text. (Asmani, 2021, p. 119). Furthermore, there is a method known as *Qira'ah 'ala al-Syaikh*, in which a student recites a specific text or book before their educator. (Chuzaemah, 2025, p. 90). Various formulas are employed depending on the form of authorization being granted. For instance: 'I hereby authorize you to transmit [the title of the book] as received from my teacher, and so forth.' Subsequently, the recipient of the *ijazah* responds: 'I accept it."…

In this context, the processes of scholarly transmission and legitimation are developed through the utilization of a digital platform known as the *Scholarly Parental Application*. This application is designed to provide an intuitive and effective user experience, analogous to other educational platforms. From a technical perspective, it features a user-friendly interface that enables both established and aspiring scholars to seamlessly navigate its various features. The application's functionalities encompass the supervision of scholarly transmission activities, progress monitoring, and access to pertinent educational resources.

Despite being facilitated through a digital platform, the authenticity of scholarly transmission within this 'scholarly parental process' remains well-preserved. This application functions not merely as a tool, but as a bridge to reinforce the accumulation and application of authentic knowledge. The content disseminated through this platform maintains the integrity and originality of its scholarly sources while simultaneously upholding core ethical academic values. The process framework is illustrated in the following figure:

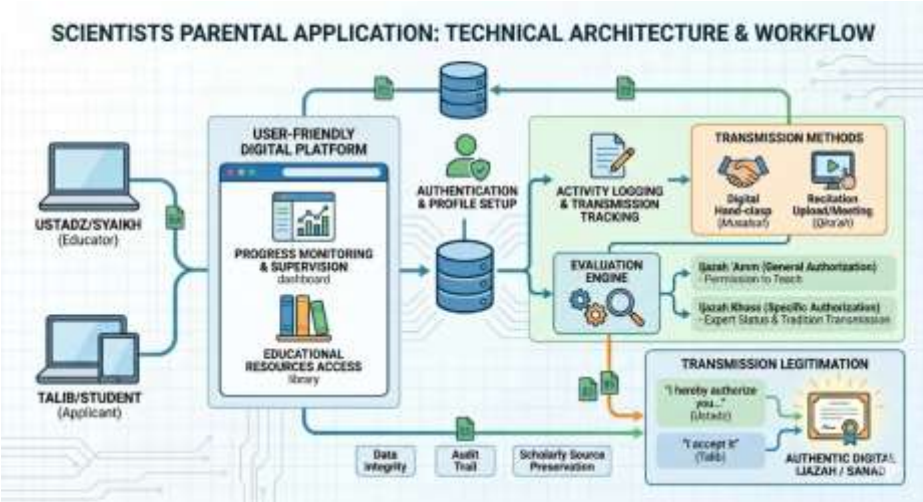

Figure 3. Scientist Parental Application Process Framework.

Conclusion

The Scientist Parental Application is a technological innovation designed and developed to support and facilitate scholars and aspiring scientists in the processes of mentorship, education, preservation, and the transmission of knowledge. The Scientist Parental Application harmonizes technological advancements with spiritual and religious dimensions. In its practical application, the platform does not merely focus on technical aspects; it is also committed to strengthening the spiritual bonds of its users. Through this approach, the aspiration to "preserve the heritage of progressive scientific ethics" can be realized. As a preliminary concept, the development of this application necessitates constructive collaboration to achieve optimal results.

References

al-Khatib, M. A. (2006). *Ushul al-Hadis; Ulumuhu Wa Musthalahuhu.* Beirut: Dar al-Kutub al-Ilmiyah.

al-Nawawi, M. a.-D. (2018). *Al-Majmu' Syarh al-Muhadzzab li al-Syirazi.* Kairo: Dar al-'Alamiyah.

Andriyani, R., Triana, A., & Juliarti, W. (2015). *Biologi Reproduksi dan Perkembangan.* Yogyakarta: Deepublish Pubsliher.

Asa, J. F. (2023). *Mengenal Parental Burnout dan Pengaruhnya pada Anak.* Yogyakarta: Elementa Media.

Asmani, J. M. (2021). *KH. Sahal Mahfudh Sang Penegak Khittah NU.* Yogyakarta: Diva Press.

Beadudry, C., Mouton, J., & Prozesky, H. (2018). *The Next Generation of Scientists in Africa.* South Africa: African Minds.

Beksultanova, O. Yu, V., & MA, Y. (2020). Application of Digital Technologies in the Educational Process. *2nd International Scientific and Practical Conference on Digital Economy (ISCDE)* (pp. 82-86). China: Atlantis Press.

Bizawe, Z. M. (2022). *Sanad Qur'an dan Tafsir di Nusantara* . Tangerang: Yayasan Compass Indonesiatama.

Burhanuddin, H. (2017). *Pesantren dalam Khazanah Pemikiran Pendidikan Islam.* Jawa Timur: Wade Group.

Chuzaemah, S. (2025). *Genealogi Keilmuan Kitab Hadis Indonesia-Mesir.* Yogyakarta: Selat Media Patners.

Fathoroni, A., & Dkk. (2020). *Buku Tutorial Sistem Pendukung Keputusan Penilaian Kinerja Dosen Menggunakan Metode 360 Degree Feedback.* Bandung: Informatics Research Center.

Gündoğdu, B., & Merç, A. (2022). A Systematic Review of Tech-supported Collaborative Creativity Practices in the Field of Education . *JOLTIDA: Journal of Learning and Teaching in Digital Age. Vol. 7. N0. 1. 2022,* 76-89.

Hasan, N. (2023). *Khazanah Ulama Perempuan Nusantara.* Yogyakarta: IRCiSoD.

Hendriani, W. (2025). *Parental Resilience: Memahami Katangguhan dalam Pengasuhan.* Surabaya: Air Langga University Press.

HS, A. H. (2020). *Kitab Misbah al-Zalam: Karya Syaikh Muhammad Amsar al-Dary Dalam Perspektif Dakwah bi al-Qalam.* Serang: Penerbit A-Empat.

Jones, C. (2016). *Software Metodologies: A Quantitative Guide.* London: CRC Press.

Kharis, M. A. (2022). *Genealogi Ulama Ahli Hadis Jawa Abad XIX-XX Masehi.* Jawa Tengah: Nasya Expanding Management.

Korucu, A. T., & Kabak, K. (2019). Digital Applications in Education and Its Effects Meta Analysis Study. *ITEJ: International Technology and Education Journal. Vol. 3. No. 2. 2019*, 19-33.

Kosim, M. (2020). *Ilmu Pendidikan Perspektif Islam.* Depok: Rajagrafindo Persada.

Mahmudah, H. (2025). *AI dan Pendidikan Islam: Integrasi Teknologi dan Spiritual.* Jawa Tengah: Wawasan Ilmu.

Mahrussilah, M. (2022). *Fiqh Neurostorytelling: Tradisi Lisan Pengajaran Fath al-Mu'in di Banten.* Serang: Penerbit A-Empat.

Mustofa, A. A. (2020). Melacak Geneologi Keilmuan Masyarakat Jalur Sanad Intelektual Muslim Bengkulu Tahun 1985-2020. *IJIHC: Indonesianl Journal of Islamic History and Culture*, 104-120.

Nay, D. S., Naqib, M. A., & Masruroh, S. A. (2025). Pemanfaatan Teknologi Digital dalam Meningkatkan Akses Dakwah di Kalangan Masyarakat. *Jurnal Kajian Agama Islam*, 29-35.

Nurdin, A., Rahtikawati, Y., & Rusmana, D. (2024). Tradisi Sanad Al-Qur'an: Implementasi Pemberian Sanad Al-Qur'an di Pondok Pesantren Qiraatussab'ah Garut. *Pappasang: Jurnal Studi Al-Qur'an-Hadis dan Pemikiran Islam. Vol. 6. No. 2. 2024*, 286-305.

Politi, V. (2025). The Collective Responsibilities of Science Toward a Normative Framework. *PSA: Philosophy Science Association. Vol. 92. N0. 1. 2025*, 1-18.

Prabowo, M. (2020). *Metodologi Pengembangan Sistem Informasi* . Salatiga: LP2M IAIN Salatiga.

Pratama, I. P. (2023). *Prototyping Sebagai Model Pengembangan Software.* Sulawesi Selatan: CV. Ruang Tentor.

Prathapan, K. (2023). *Research Methodology for Scientific Research.* New Delhi: I.K International Pvt. Ltd.

Rimatuzzahriah, E., Abrar, & Ibrahim, N. (2023). Implementation Of Moodle Application In History Learning Under The Merdeka Curriculum. *Prosiding Seminar Nasional Sosial dan Humaniora* (pp. 91-101). Yogyakarta: Sanata Dharma University Press.

Rohmad, H., Kurniawati, H., & Prima, E. (2025). *Generasi Z dan Alpha: Potensi, Problem dan Solusi.* Jawa Tengah: Wawasan Ilmu.

Rusmanto. (2020). *Pengantar Open Source dan Aplikasi* . Jakarta: Nurul Fikri Press.

Thahhan, M. (2004). *Taysir Musthalah al-Hadis.* Kairo: Maktabah al-Ma'arif.

Vertygo, S. (2021). *Biologi Dasar.* Aceh: Syiah Kuala University Press.

Virasiri, S., Yunibhand, J., & Chaiyawat, W. (2011). Parenting: What Are The Critical Attributes? *J Med Assoc. Vol. 94. No. 9. 2011*, 1109-1115.

Waseso, B., & dkk. (2025). *Manajemen Proyek Perangkat Lunak.* Jakarta: Faaslib Serambi Media.

Yuniardi, T. D. (2022). *Psikologi Lintas Budaya.* Malang: UMM Press.

Zou, Y., Kuek, F., Feng, W., & Cheng, X. (2025). Digital learning in the 21st century: trends, challenges, and innovations in technology integration. *Fronties In Education;Volume. 10. 2025*, 1-11.