

Enhancing Teacher Professionalism in Indonesia: Challenges and Strategies for Digital Technology Utilization in the Society 5.0 Era

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Abstract: The Society 5.0 era presents new challenges for the world of education, especially in improving teacher professionalism in utilizing digital technology. This study aims to analyze the challenges teachers face and identify strategies that can be applied to enhance their professionalism. The research method used is the Narrative Literature Review (NLR), with a qualitative approach based on thematic analysis of various relevant literature sources. The PRISMA method is applied to ensure a systematic selection and analysis process. The study results indicate that teacher professionalism in the Society 5.0 era is influenced by five main aspects: understanding digital technology, developing 21st-century competencies, implementing a humanistic learning approach, increasing capacity through continuous learning, and collaborating with various educational stakeholders. However, teachers face multiple challenges, including adaptation to digital technology, the digital literacy gap, the complexity of teacher tasks, inequality in access to technology, and demands for continuous competency development. The implications of this study emphasize the need for a holistic approach to improving teacher professionalism, with policy support that encourages constant training and the provision of adequate digital infrastructure. With the right strategy, teachers can optimize their role in forming an adaptive, innovative, and highly competitive generation in the Society 5.0 era.

Abstrak: Era Society 5.0 menghadirkan tantangan baru bagi dunia pendidikan, terutama dalam meningkatkan profesionalisme guru dalam pemanfaatan teknologi digital. Penelitian ini bertujuan untuk menganalisis tantangan yang dihadapi guru serta mengidentifikasi strategi yang dapat diterapkan untuk meningkatkan profesionalisme mereka. Metode penelitian yang digunakan adalah Narrative Literature Review (NLR), dengan pendekatan kualitatif berbasis analisis tematik terhadap berbagai sumber literatur yang relevan. Metode PRISMA diterapkan untuk memastikan proses pemilihan dan analisis yang sistematis. Hasil penelitian menunjukkan bahwa profesionalisme guru di era Society 5.0 dipengaruhi oleh lima aspek utama: pemahaman teknologi digital, pengembangan kompetensi abad ke-21, penerapan pendekatan pembelajaran humanis, peningkatan kapasitas melalui pembelajaran berkelanjutan, serta kolaborasi dengan berbagai pemangku kepentingan dalam pendidikan. Namun, terdapat berbagai tantangan yang dihadapi guru, antara lain adaptasi terhadap teknologi digital, kesenjangan literasi digital, kompleksitas tugas guru, ketimpangan akses teknologi, dan tuntutan pengembangan kompetensi secara berkelanjutan. Implikasi dari penelitian ini menegaskan perlunya pendekatan holistik dalam peningkatan profesionalisme guru, dengan dukungan kebijakan yang mendorong pelatihan berkelanjutan serta penyediaan infrastruktur digital yang memadai. Dengan strategi yang tepat, guru dapat mengoptimalkan peran mereka dalam membentuk generasi yang adaptif, inovatif, dan berdaya saing tinggi di era Society 5.0.

1. Introduction

The Society 5.0 era is a concept introduced by the Japanese government in 2019. It is referred to as the "super-smart society" era because technologies such as the Internet of Things (IoT), Artificial Intelligence (AI), Big Data, Cloud Computing, and Robotics are



utilized to enhance human quality of life.¹ This era was developed as a response to the disruptions caused by the Industrial Revolution 4.0, which led to complex and ambiguous uncertainties.² In this era, technology is not merely a tool but also a partner that assists humans in solving social and environmental issues. As a result, digital technology has advanced far more rapidly than in the previous era, the Industrial Revolution 4.0. However, this rapid technological advancement raises concerns about the potential erosion of human values preserved over time.³ The Society 5.0 era brings positive and negative impacts across various aspects of life. The rapid development of science and technology necessitates preparedness to face global changes, particularly in education. The role of teachers and educators in the Society 5.0 era must be prioritized. Quality education should leverage these advancements to enhance students' intelligence; however, it is not without its challenges.⁴ These challenges must be addressed to minimize the negative impacts of rapid digital technology growth in education.

Educators should not focus solely on knowledge transfer but emphasize character education, morality, and exemplary behavior. While technology can replace knowledge transfer, it cannot substitute the application of soft and hard skills, regardless of sophistication. Even before fully overcoming the challenges of the Industrial Revolution 4.0, educators now face the additional complexities of the Society 5.0 era. Therefore, proactive measures are necessary to ensure that education in Indonesia remains resilient and beneficial in shaping an intelligent future generation.

Conceptually, teachers must meet various competency requirements to carry out their duties and responsibilities professionally. However, the current situation in the field remains concerning, both in terms of the quantity and quality of teacher professionalism. Research conducted by Loso Judijanto reported an average digital literacy level of 3.75 (on a scale of 1 to 5), indicating a relatively proficient understanding of digital tools and technology.⁵ However, this also highlights a lack of knowledge in effectively utilizing digital technology. This issue is further compounded by the complex challenges of the Society 5.0 era. Teachers from the pre-digital era struggle to adapt to the fully digital education landscape. Their learning habits and approaches differ significantly from those of the current generation. This gap can lead to a disconnect between students on one side and teachers and parents on the other. However, a teacher's ability to create a conducive learning environment is crucial in ensuring quality education.⁶ In this technology-driven era, teachers must master pedagogical competencies and information technology skills to support the teaching and learning process. Rahman defines pedagogical competence as "the ability to manage learning, which includes planning, implementation, and

¹ Marsumi Marsumi and Marthinus M. Krowin, "Peningkatan Kompetensi Di Era Society 5.0," *Prosiding Seminar Nasional Forum Manajemen Indonesia - e-ISSN 3026-4499 2* (November 2024): 1725-30, <https://doi.org/10.47747/snfmi.v2i1.2425>.

² Marianus Subandowo, "Teknologi Pendidikan Di Era Society 5.0," *Jurnal Pendidikan Sagacious* 9, no. 1 (2022), <https://rumahjurnal.net/sagacious/article/view/1139>.

³ Esty Setyo Utaminingsih et al., "A Systematic Review: Digital Literacy for Strengthening Character in Facing the Era of Society 5.0," *Research and Development Journal of Education* 9, no. 2 (October 2, 2023): 638, <https://doi.org/10.30998/rdje.v9i2.15173>.

⁴ Subandowo, "Teknologi Pendidikan Di Era Society 5.0."

⁵ Loso Judijanto, "Analisis Pengaruh Tingkat Literasi Digital Guru Dan Siswa Terhadap Kualitas Pembelajaran Di Era Digital Di Indonesia," *Sanskara Pendidikan Dan Pengajaran* 2, no. 02 (May 2024): 50-60, <https://doi.org/10.58812/spp.v2i02.391>.

⁶ Dwi Purbowati, *Metode Dan Teknik Pembelajaran* (Jakarta Selatan: Galiono Digdaya Kawthar, 2022).



evaluation of learning outcomes."⁷ This definition highlights that pedagogical competence encompasses planning, implementing, and evaluating learning.

Thus, a teacher's success in teaching largely depends on their pedagogical skills. These competencies must evolve alongside digital transformation to remain relevant to modern educational needs in the Society 5.0 era. Meanwhile, information technology competency involves utilizing digital tools, such as e-learning platforms, social media, interactive learning applications, and other digital aids, to facilitate more effective and flexible education. Mastery of digital technology is also essential in addressing the challenges of this era. Meanwhile, information technology competency involves utilizing digital tools, such as e-learning platforms, social media, interactive learning applications, and other digital aids, to facilitate more effective and flexible education. Mastery of digital technology is also essential in addressing the challenges of this era.

However, technology-based education does not always run smoothly. Many teachers struggle to develop their digital competencies, a concerning issue in Indonesia's education sector. Technological advancements do not always align with teachers' progress. A stark contrast exists between students and teachers: students are already highly advanced in the digital realm, while many teachers rely on traditional teaching methods. While students are more digitally literate, many lack control and ethical awareness in their use of technology.⁸ Teachers should play a crucial role in guiding students in this regard. Despite the growing importance of global education, this issue reflects a general deficiency in digital literacy among teachers and students. According to the Global World Digital Competitiveness Index (2019), Indonesia ranks 56th out of 63 countries regarding digital literacy quality. These challenges could negatively impact educational quality and student learning outcomes if they are not systematically and sustainably addressed.⁹

Teacher professionalism in the Society 5.0 era requires technological proficiency alongside applying pedagogical principles that align with the digital landscape. Therefore, identifying the challenges faced by teachers is essential. From these challenges, strategies can be formulated to help teachers improve their competencies. The current educational system is experiencing disruptions that raise concerns and doubts about whether traditional methods can effectively adapt to a digitally driven system. Consequently, educators must develop their fundamental competencies to address the challenges of this era. Challenges inevitably lead to necessary actions to overcome them.¹⁰ Therefore, further study is required to explore teachers' challenges in utilizing digital technology and to develop appropriate strategies for addressing them.

Research on the challenges and strategies for enhancing teacher professionalism in the Society 5.0 era has been widely conducted. For instance, Eliwatis et al., in their journal article "Challenges of Society Era Education 5.0: Revitalization of Teacher Competencies and Learning Models," found that teachers need several key competencies to face educational challenges in the Society 5.0 era. These include educational competence, acting as role models for students, research competence, digital competence (digital

⁷ Mardia Hi Rahman, "Professional Competence, Pedagogical Competence and the Performance of Junior High School of Science Teachers," *Journal of Education and Practice* 5, no. 9 (2014): 75–80, <https://www.iiste.org/Journals/index.php/JEP/article/view/11868>.

⁸ Feliks Rejeki Sotani Zebua, "Analisis Tantangan Dan Peluang Guru Di Era Digital," *Jurnal Informatika Dan Teknologi Pendidikan* 3, no. 1 (June 27, 2023): 21–28, <https://doi.org/10.25008/jitp.v3i1.55>.

⁹ King Anugrah Wiguna, "Analisis Kompetensi Literasi Digital Pada Guru Sekolah Menengah Atas," *Jurnal Riset Manajemen Komunikasi* 3, no. 1 (July 2023): 21–32, <https://doi.org/10.29313/jrmk.v3i1.2316>.

¹⁰ Badrul Mudarris, "Profesionalisme Guru Di Era Digital; Upaya Dalam Meningkatkan Mutu Lembaga Pendidikan," *ALSYS* 2, no. 6 (November 2022): 712–31, <https://doi.org/10.58578/alsys.v2i6.640>.

literacy), global competence in globalization, leadership competence, communication competence, teamwork competence, critical thinking, creativity, and problem-solving skills.¹¹ Another relevant study by Dermawan et al., titled "Basic Education in the Era of Society 5.0: Opportunities and Challenges," highlights that technology integration in primary education presents major and significant opportunities. Their research focuses on three key aspects: challenges in curriculum development, the role of teachers in the digital era, and the impact of technology on the learning process.¹² Similarly, research by Chaer et al., in their article "Teacher Professionalism and Educational Challenges of The Industrial Revolution 5.0," emphasizes the importance of teacher professionalism in addressing educational challenges in the Industrial Revolution 5.0 era. Their study asserts that teachers are responsible for teaching, nurturing, guiding, and shaping students' character to prepare them as human resources for the future.¹³

From these studies, it is evident that addressing the challenges of the Society 5.0 era is crucial. Therefore, a deeper exploration of this issue is necessary. Unlike previous studies, this research specifically examines the challenges teachers face in developing professionalism within digital technology utilization and strategies to enhance their competencies. Appropriate strategies can be identified to address these challenges by gaining a deeper understanding of them. The findings are expected to provide valuable insights for policymakers, educational institutions, and teachers in creating a supportive academic environment aligned with the Society 5.0 era.

Based on the above discussion, this study formulates two main research questions: (1) What are teachers' primary challenges in implementing digital technology in the Society 5.0 era? (2) What strategies can be implemented to enhance teacher professionalism in overcoming these challenges? To address these questions, this study employs a literature analysis approach. The research aims to analyze the challenges and strategies for improving teacher professionalism amid the complexities of the Society 5.0 era. Thus, this study seeks to provide practical recommendations for improving learning effectiveness. The research is essential as it offers educators insights into strategies for navigating various challenges in the Society 5.0 era, particularly in Indonesia. It is hoped that these findings will contribute to the professional development of teachers, ultimately improving the quality of education in Indonesia. Therefore, further discussions are needed on how teachers, schools, and policymakers can implement the proposed strategies in real-world contexts.

2. Method

This study employs a qualitative approach using a literature review research design. A literature review is a collection of articles from journals, books, and other documents explaining past and present theories and information while organizing the literature into relevant topics and required documents.¹⁴ The type of literature review used in this study

¹¹ Eliwatis Eliwatis et al., "Challenges of Society Era Education 5.0: Revitalization of Teacher Competencies and Learning Models," *Darussalam: Journal of Psychology and Educational* 1, no. 2 (December 2022): 1–11, <https://doi.org/10.55849/djpe.v1i2.16>.

¹² Heri Dermawan and Sri Sumarni, "Basic Education in the Era of Society 5.0: Opportunities and Challenges," *International Journal of Educatio Elementaria and Psychologia* 1, no. 4 (August 2024): 180–87, <https://doi.org/10.70177/ijep.v1i4.1110>.

¹³ Moh Toriqul Chaer, Azizunisak Hidayati Wahyuna, and Susi Fitriana, "Teacher Professionalism and Educational Challenges of The Industrial Revolution 5.0," *AL-MURABBI: Jurnal Studi Kependidikan Dan Keislaman* 7, no. 1 (June 16, 2020): 53–63, <https://doi.org/10.53627/jam.v7i1.3925>.

¹⁴ Bakhrudin All Habsy, "Seni Memahami Penelitian Kuliatatif Dalam Bimbingan Dan Konseling : Studi Literatur," *JURKAM: Jurnal Konseling Andi Matappa* 1, no. 2 (September 2017): 90,



is the Narrative Literature Review (NLR). A narrative review allows researchers to describe what is known about a topic while subjectively examining and critiquing the entire body of literature.¹⁵

One of the advantages of the NLR approach is its ability to explain current topics and provide insights into advancing the field, developing new theories, or presenting recent evidence from different or unconventional perspectives.¹⁶ The researcher will utilize relevant literature from books, journal articles, popular articles, theses, and other scholarly works.

In this study, the keywords used for database searches include "digital education in Society 5.0," "digital education in Indonesia," and "teacher professionalism." The study will consist of qualitative, quantitative, and mixed-method research. The publication period is from 2020 to 2025, although classical theories will also be included if relevant. The selected articles will be in English and Indonesian, and the databases used for sourcing literature include Scopus, the Science and Technology Index, the Web of Science, and Google Scholar.

The data collection technique employed in this study is documentation, which involves gathering various relevant and credible literature sources. The credibility of the sources is assessed based on the index of the source, the publication date, and the relevance of the content. The data analysis method used in this research is thematic analysis. This method is highly effective for examining qualitative data in detail to identify patterns and relationships within a phenomenon and to explain the extent of its occurrence from the researcher's perspective. The collected data is then reviewed and analyzed using relevant theories to ensure accurate interpretation.¹⁷ This study applies the PRISMA method (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) to ensure a more rigorous and structured selection and analysis of the literature.

PRISMA is a systematic approach that follows a structured process, starting with Identification, Screening, Eligibility, and Inclusion. This study's final selection for analysis consists of 50 sources, including journal articles or scientific papers and books such as theses and dissertations.

<https://doi.org/10.31100/jurkam.v1i2.56>.

¹⁵ Javeed Sukhera, "Narrative Reviews: Flexible, Rigorous, and Practical," *Journal of Graduate Medical Education* 14, no. 4 (August 2022): 414–17, <https://doi.org/10.4300/JGME-D-22-00480.1>.

¹⁶ Phillip D. Rumrill, Jr. and Shawn M Fitzgerald, "Using Narrative Literature Reviews to Build a Scientific Knowledge Base," *WORK: A Journal of Prevention, Assessment & Rehabilitation* 16, no. 2 (January 1, 2001): 165–70, <https://doi.org/10.3233/WOR-2001-00173>.

¹⁷ Jennifer Fereday and Eimear Muir-Cochrane, "Demonstrating Rigor Using Thematic Analysis: A Hybrid Approach of Inductive and Deductive Coding and Theme Development," *International Journal of Qualitative Methods* 5, no. 1 (March 1, 2006): 80–92, <https://doi.org/10.1177/160940690600500107>.

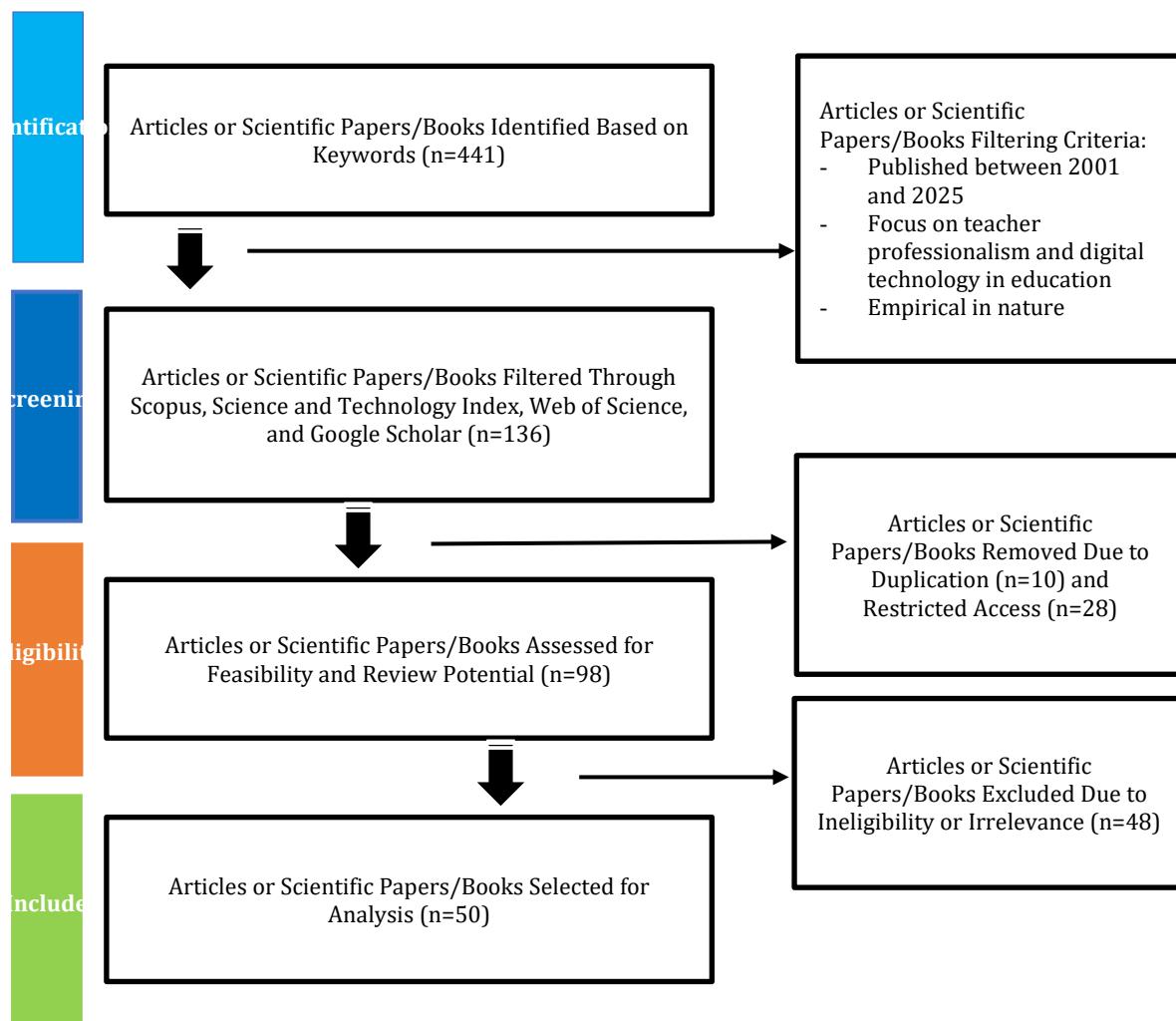


Figure 1. Article or Scientific Paper/Book Search Process

3. Result and Discussion

3.1. Education in the Society 5.0 Era

The Society 5.0 era is a continuation of the Fourth Industrial Revolution. The Fourth Industrial Revolution marked a rapid advancement in information technology, which expanded the Internet of Things (IoT) into various aspects of society. In the Society 5.0 era, people are confronted with technologies that enable virtual spaces to feel as tangible as physical spaces.¹⁸ This era leverages artificial intelligence (AI) powered by big data and robotics to perform or support human tasks. Unlike the Fourth Industrial Revolution, which primarily emphasized business and industry, Society 5.0 introduced new values that eliminated social, age, gender, and language disparities while providing products and services tailored to the diverse needs of individuals and society.¹⁹

In terms of learning during the Fourth Industrial Revolution, teachers implemented a hybrid or blended learning model.²⁰ Elena Mosa states that this approach combines two

¹⁸ Faulinda Nastiti and Aghnii Abdu, "Kajian: Kesiapan Pendidikan Indonesia Menghadapi Era Society 5.0," *Edcomtech Jurnal Kajian Teknologi Pendidikan* 5, no. 1 (April 1, 2020): 61–66, <https://doi.org/10.17977/um039v5i12020p061>.

¹⁹ Nastiti and Abdu.

²⁰ Chaer, Wahyuna, and Fitriana, "Teacher Professionalism and Educational Challenges of The Industrial Revolution 5.0."

key elements: conventional face-to-face classroom instruction and online learning.²¹ Students are expected to think critically through case-based learning methods in this era. Case-based learning is a student-centered technique that develops students' abilities to analyze cases and provide problem-solving strategies. However, in the Society 5.0 era, education must go beyond this by optimizing students' potential and talents while equipping them with 21st-century skills. The core competencies of 21st-century education include creativity, critical thinking, communication, and collaboration, commonly called the 4Cs.²² More than just acquiring knowledge, 21st-century learning emphasizes interdisciplinary skills such as problem-solving, communication, information technology proficiency, and lifelong learning. Students are encouraged to become independent learners who can adapt to change, collaborate with others, and contribute to an evolving society.²³

A professional teacher possesses four core competencies: pedagogical, personal, experienced, and social. These competencies are outlined in Law No. 14 of 2005 on Teachers and Lecturers, specifically in Article 10, and further regulated in the National Education Ministerial Regulation No. 16 of 2007 concerning the Standards for Teachers' Academic Qualifications and Competencies. In the Society 5.0 era, teacher professionalism is about teaching skills and preparing students to become competent, creative, and ethical individuals in an increasingly complex and interconnected world.²⁴ Moreover, teachers are expected to shape and strengthen students' character, particularly in the wise use of digital technology. Teachers must integrate technology with a humanistic approach to create relevant and sustainable education. Eight essential skills are required in the 21st century: leadership, digital literacy, communication, emotional intelligence, entrepreneurship, global citizenship, problem-solving, and teamwork. Education in the Society 5.0 era must also integrate technology into the learning process, not only as a medium but also as a resource and evaluation tool. Technology can assist students in accessing extensive and relevant information, interacting with individuals from diverse backgrounds and cultures, and demonstrating their learning outcomes in innovative and engaging ways.

3.2. Teacher Professionalism in the Society 5.0 Era

Education in the Society 5.0 era adopts a human-centered concept supported by integrating advanced technologies such as the Internet of Things (IoT), Artificial Intelligence (AI), Big Data, and robotics.²⁵ The primary focus of this era is to create a balance between technological advancements and human needs, aiming to improve the quality of life. In this context, teacher professionalism becomes increasingly vital as teachers play a central role in shaping a generation that can adapt to and utilize technology wisely. Rather than perceiving digital technology as a threat, teachers must

²¹ Evhans Perdana Sinaga, "Blended Learning: Transisi Pembelajaran Konvensional Menuju Online," in *Prosiding Seminar Nasional Fakultas Ilmu Sosial Universitas Negeri Medan* (Medan: Universitas Negeri Medan, 2019), <https://digilib.unimed.ac.id/id/eprint/37343/>.

²² Prianto Yudi et al., "Analisis Pendidikan Indonesia Di Era Revolusi Industri 4.0," *Universitas Muhammadiyah Sidoarjo*, 2019.

²³ Salzabella Wahyu Fransisca, "Integrasi Pembelajaran Abad 21 Dalam 4C (Communication, Creativity and Inovation, Collaboration, Critical Thinking) Di Pondok Pesantren Sulamul Huda Siwalan," *Muaddib: Jurnal Pendidikan Agama Islam* 2, no. 02 (2024): 32–45, <https://ejurnal.insuriponorogo.ac.id/index.php/muaddib/article/view/5584>.

²⁴ Ammar Zaki et al., "Peran Guru Dalam Penguatan Karakter Siswa Di Era Society 5.0 (Optimalisasi Pemanfaatan Teknologi Pembelajaran)," *Jurnal Dedikasi Pendidikan* 8, no. 2 (July 2024), <https://doi.org/10.30601/dedikasi.v8i2.5566>.

²⁵ Marsumi and Krowin, "Peningkatan Kompetensi Di Era Society 5.0."

guide students to view it as an opportunity for progress. There are five key aspects that professional teachers must consider:

3.2.1. Digital Technology Literacy

Teachers must possess strong digital literacy and understand how to use and integrate technology into the learning process. They must be innovative and creative in developing teaching methods to enhance technology-based learning. Teachers should proficiently utilize digital tools such as Learning Management Systems (LMS), AI-based applications, and interactive learning platforms to support personalized education.

3.2.2. Development of 21st-Century Competencies

Education in the Society 5.0 era emphasizes the development of 21st-century competencies. These include skills directly related to information technology, such as ethical and social dimensions, information literacy, and communication skills. Therefore, teachers must develop relevant competencies, such as critical thinking to help students solve complex problems, creativity in designing innovative learning strategies, and communication and collaboration skills to support project-based and team-based learning. Preparing students to become excellent individuals will, in turn, contribute to developing high-quality human resources.

3.2.3. Humanistic Learning Approach

The Society 5.0 era emphasizes humanism in addressing social issues, including education, by integrating virtual and real-life experiences. One of the most critical competencies required for this era is the ability to solve problems using a humanistic approach.²⁶ Although technology plays a crucial role, teacher professionalism in Society 5.0 should continue emphasizing humanistic values. Teachers must consider the education's emotional, moral, and humanitarian aspects, guiding students to use technology ethically and responsibly.

3.2.4. Capacity Building Through Continuous Learning

Teachers must continuously learn and develop their skills through training, workshops, and professional development programs. This includes enhancing technical and pedagogical skills relevant to the needs of the Society 5.0 era. Professional development is essential for teachers to meet the growing challenges of teaching in this era, ensuring they uphold the dignity of the teaching profession.²⁷

3.2.5. Collaboration with Key Stakeholders in Educational Environment

A well-structured education system, aligned with national regulations, must be built through hard work and collaboration among all key stakeholders in the Indonesian education system. A high-quality education system is achieved when schools are led by competent and creative principals who foster positive relationships with teachers. This, in turn, creates a supportive educational environment that encourages students to excel academically and develop good character. Effective communication among teachers is crucial to ensuring smooth and productive learning processes.²⁸

²⁶ Iwan Hermawan, Supiana Supiana, and Qiqi Yuliatni Zakiah, "Kebijakan Pengembangan Guru Di Era Society 5.0," *JIEMAN: Journal of Islamic Educational Management* 2, no. 2 (2020): 117-36, <https://jieman.iain-jember.ac.id/index.php/jieman/article/view/33>.

²⁷ Ani Apiyani et al., "Implementasi Pengembangan Keprofesian Berkelanjutan (PKB) Guru Madrasah Dalam Meningkatkan Keprofesian," *JIIP - Jurnal Ilmiah Ilmu Pendidikan* 5, no. 2 (February 3, 2022): 499-504, <https://doi.org/10.54371/jiip.v5i2.443>.

²⁸ Zulmi Ramdani, Silmi Amrullah, and Lidwina Felisima Tae, "Kolaborasi Antara Kepala Sekolah, Guru Dan Siswa Dalam Menciptakan Sistem Pendidikan Yang Berkualitas," in *National Conference on Educational*



3.3. Challenges to Teacher Professionalism

The role of teachers as educators, facilitators, and mentors in the Society 5.0 era is crucial.²⁹ However, maintaining professionalism amid rapid technological and social changes presents several challenges. Based on an accumulation of various literature sources, the following are some of the key challenges:

3.3.1. Adapting to Digital Technology

Education serves as the foundation for future development. In an environment where digital technology has transformed nearly every aspect of life, teachers must act as proficient navigators in the rapidly evolving digital world. The rapid advancement of technology has significantly altered the teaching profession. In the Society 5.0 era, teachers must possess the ability to undergo a cultural transformation as education shifts from conventional methods to modern, technology-driven learning. Teachers are no longer just knowledge providers; they also serve as learning facilitators, innovators, and leaders who guide students toward success in the digital era. Despite the essential role of technology, not all teachers have the necessary skills or knowledge to integrate technology effectively into the learning process.³⁰

3.3.2. Digital Literacy Gap

Digital literacy refers to an individual's ability to use digital technology effectively. This competency has introduced a new paradigm in the education system, particularly in teaching and learning activities. Teachers play a crucial role in implementing digital literacy in education.³¹ Digital literacy refers to an individual's ability to use digital technology effectively. This competency has introduced a new paradigm in the education system, particularly in teaching and learning activities. Teachers play a crucial role in implementing digital literacy in education.

3.3.3. The Complexity of Teacher Tasks

Digital literacy refers to an individual's ability to use digital technology effectively. This competency has introduced a new paradigm in the education system, particularly in teaching and learning activities. Teachers play a crucial role in implementing digital literacy in education. Digital literacy refers to an individual's ability to use digital technology effectively.³² This competency has introduced a new paradigm in the education system, particularly in teaching and learning activities. Teachers play a crucial role in implementing digital literacy in education.

3.3.4. Disparities in Technology Access

One of the main challenges in digitalizing education is the presence of numerous internet blank spots, where either no internet signal is available, or the signal is extremely weak due to topographical factors.³³ This results in disparities in technology access.

Assessment and Plolicy, 2018, <https://doi.org/https://doi.org/10.26499/NCEAP.V1I1.66>.

²⁹ Viva Fadma Onilivia and Noptario Noptario, "Educator Excellence in the Era of Society 5.0: A Hadith Perspective," *HEUTAGOGIA: Journal of Islamic Education* 4, no. 1 (June 2024): 47–58, <https://doi.org/10.14421/hjie.2024.41-04>.

³⁰ Khalisatun Husna et al., "Transformasi Peran Guru Di Era Digital: Tantangan Dan Peluang," *Perspektif: Jurnal Pendidikan Dan Ilmu Bahasa* 1, no. 4 (2023): 154–67.

³¹ Chika Kharisma Salsabila and Kemil Wachidah, "Pola Kemampuan Literasi Digital Guru: Menelaah Kesenjangan Literasi Digital Dari Perspektif Gender," *Jurnal Pemikiran Dan Pengembangan Sekolah Dasar (JP2SD)* 12, no. 2 (2024): 322–38, <https://doi.org/https://doi.org/10.22219/jp2sd.v12i2.34862>.

³² Chasnah Nailah and Midayati Afifa, "Komitmen Guru Profesional Di Era Society 5.0," *Jurnal Pedagogik Pendidikan Dasar* 9, no. 1 (June 2022): 1–10, <https://doi.org/10.17509/jppd.v9i1.41774>.

³³ Anita Anita and Siti Irene Astuti, "Digitalisasi Dan Ketimpangan Pendidikan: Studi Kasus Terhadap Guru Sekolah Dasar Di Kecamatan Baraka," *Jurnal Pendidikan Dan Kebudayaan* 7, no. 1 (June 15, 2022): 1–

Additionally, the equitable distribution of facilities remains a crucial challenge. The imbalance between schools with complete facilities significantly affects the learning process in alignment with the Society 5.0 era.

3.3.5. The Demand for Continuous Competency Development

Teachers in the Society 5.0 era must continuously learn and develop skills to effectively deliver character education and optimize technology use in learning. This ensures that students engage positively with technology and develop essential competencies. Teachers must hold an Akta IV certificate; thus, the government's policy on teacher competency development currently includes a teacher certification program to establish teaching as a professional career.³⁴ However, many teachers face obstacles such as time constraints in attending training, lack of institutional or governmental support, and high training costs.

3.3.6. Ethical and Digital Security Challenges

Ethics and digital security are crucial in the Society 5.0 era. Research by Chika and Kemil indicates that teachers' digital ethics skills rank the lowest compared to other competencies.³⁵ This demonstrates the difficulty in acquiring proper ethical and digital security skills. Teachers face various challenges, including student misuse of technology (such as plagiarism or cyberbullying), secure management of students' data in compliance with regulations, and providing students with a strong understanding of digital ethics.

3.4. Strategies for Teacher Professionalism

In addressing the challenges of the Society 5.0 era, teachers must develop well-planned strategies to maintain and enhance their professionalism. These strategies require continuous learning, innovation, and adaptation to technological advancements. By integrating technology, humanistic approaches, and collaboration, teachers can confidently tackle challenges in this era while significantly impacting education.³⁶ The following strategies are derived from an analysis of various relevant sources, combined with the researchers' perspectives:

3.4.1. Enhancing Digital Literacy

Teachers must improve their ability to use digital technology as a learning tool. Strategies include participating in training on digital learning applications such as Learning Management Systems (LMS), Artificial Intelligence (AI), and Virtual Reality (VR).³⁷ Many online platforms now facilitate self-learning through webinars, tutorials, and online courses, addressing cost, time, and location constraints. Networking with teacher communities is also essential for sharing experiences and best practices in technology use in education

12, <https://doi.org/10.24832/jpnk.v7i1.2509>.

³⁴ Hermawan, Supiana, and Zakiah, "Kebijakan Pengembangan Guru Di Era Society 5.0."

³⁵ Salsabila and Wachidah, "Pola Kemampuan Literasi Digital Guru: Menelaah Kesenjangan Literasi Digital Dari Perspektif Gender."

³⁶ Rachel Theresa Laras Pratiwi and Mahmuddin Yunus, "Manfaat Dan Tantangan Penggunaan Artificial Intelligence (AI) Bagi Guru Dan Peserta Didik Di Era Society 5.0," *Journal of Innovation and Teacher Professionalism* 3, no. 2 (November 13, 2024): 488–94, <https://doi.org/10.17977/um084v3i22025p488-494>.

³⁷ Steven Van Vaerenbergh and Adrián Pérez-Suay, "Intelligent Learning Management Systems," 2022, 206–32, <https://doi.org/10.4018/978-1-7998-9247-2.ch009>.

3.4.2. Technology-Based Learning Approaches

Teachers must integrate technology into the learning process. Personalizing learning based on students' needs is essential.³⁸ For instance, teachers can implement Project-Based Learning (PBL) methods that utilize technology to foster creativity and collaboration while ensuring guidance on ethical and responsible technology use

3.4.3. Developing 21St-Century Competencies

Teachers must develop relevant competencies: 1) Critical Thinking: Training students to analyze information and solve complex problems. 2) Creativity: Designing engaging, innovative, and real-world-relevant learning experiences. And 3) Communication and Collaboration: Encouraging student teamwork and fostering global connectivity.³⁹

3.4.4. Enhancing Emotional and Mental Well-Being

Teachers must maintain their emotional and mental health to remain productive. Three key efforts include effective time management to balance professional and personal responsibilities, participating in emotional intelligence and stress management training, and utilizing professional support networks such as teacher communities or educational counselors.⁴⁰

3.4.5. Developing Continuous Professionalism

Teachers should embrace lifelong learning as part of their careers. Continuous professional development enhances teachers' career professionalism.⁴¹ Three approaches include attending local and international educational conferences to broaden knowledge, reading academic journals or books on contemporary education, and participating in professional development programs such as certifications, workshops, and seminars.⁴²

3.4.6. Utilizing Big Data in Learning

Big data in education encompasses student learning data, a crucial benchmark for learning improvement.⁴³ Teachers can leverage data to enhance learning effectiveness by analyzing student learning outcomes to understand their needs, using data to design more personalized and efficient learning strategies, and adopting technology-based assessment systems that provide real-time feedback.⁴⁴

3.4.7. Collaborating with Parents and the Community

Effective collaboration with parents and the community can enhance support for student learning at home, connect students with real-world experiences through partnerships with local industries, and provide input and support in addressing technological

³⁸ Jaya Wibowo Pranata Silalahi, Dylmoon Hidayat, and Christy Nathali, "Digital Transformation in Education to Foster Personalized Learning," *JIIP - Jurnal Ilmiah Ilmu Pendidikan* 7, no. 11 (November 2024): 12858-65, <https://doi.org/10.54371/jiip.v7i11.6198>.

³⁹ Siti Zubaidah, "Keterampilan Abad Ke-21: Keterampilan Yang Diajarkan Melalui Pembelajaran," *Seminar Nasional Pendidikan* 2, no. 2 (2016): 1-17.

⁴⁰ Henry R Meyer, *Manajemen Dengan Kecerdasan Emosional* (Nuansa Cendekia, 2024).

⁴¹ Yayah Rahyasilah, Nani Hartini, and Liah Siti Syarifah, "Pengembangan Keprofesian Berkelanjutan: Sebuah Analisis Kebutuhan Pelatihan Karya Tulis Ilmiah Bagi Guru," *Jurnal Penelitian Pendidikan* 20, no. 1 (May 10, 2020): 136-44, <https://doi.org/10.17509/jpp.v20i1.24565>.

⁴² Sudarwan Danim, *Pengembangan Profesi Guru* (Prenada Media, 2012).

⁴³ Veri Ferdiansyah and Muhammad Irwan Padli Nasution, "Penerapan Teknologi Big Data Dalam Pengembangan Database Pendidikan," *Jurnal Riset Manajemen* 1, no. 3 (July 2023): 22-29, <https://doi.org/10.54066/jurma.v1i3.591>.

⁴⁴ Hamid Sakti Wibowo, *Pengembangan Teknologi Media Pembelajaran: Merancang Pengalaman Pembelajaran Yang Inovatif Dan Efektif* (Tiram Media, 2023).

challenges.⁴⁵ Such collaboration has been shown to increase student motivation in learning.⁴⁶

3.4.8. Promoting Digital Ethics and Character

Digital ethics are essential to prevent the misuse of technology. Teachers play a vital role in instilling ethical digital values in students by teaching proper online behavior with respect and responsibility, raising awareness about digital security (such as protecting privacy and avoiding misinformation), and guiding students to use technology as a tool for positive and progressive purposes.⁴⁷

3.4.9. Maximizing the Utilization of Educational Resources

Teachers can seek and utilize available online educational resources, including free or paid e-learning platforms, easily accessible digital teaching materials, and technological tools such as simulations, educational games, and interactive media.

Table 1. Analysis of Literature Review Findings on Challenges and Strategies for Teacher Professionalism in Digital Technology Utilization

Key Aspects for Teachers to Consider	6 Challenges in Teacher Professionalism (Digital Technology Utilization)	9 Strategies to Address Challenges		
Understanding Digital Technology	Adapting to Digital Technology	Enhancing Digital Literacy		
Developing 21st-Century Competencies	Digital Literacy Gap	Technology-Based Learning Approach		
Humanistic Learning Approach	Complexity of Teacher Tasks	Developing 21st-Century Competencies		
Capacity through Learning	Building Lifelong	Disparities in Technology Access	Enhancing Emotional and Mental Well-Being	
		Demand for Continuous Competency Development	Developing Professionalism	Continuous
Collaboration with Key Educational Stakeholders		Ethical and Digital Security Challenges	Utilizing Big Data in Learning, Collaborating with Parents and the Community	Promoting Digital Ethics and Character
				Maximizing the Utilization of Educational Resources

3.5. Digital Literacy and 21st Century Competencies as Pillars of Modern Education and Teacher Professionalism

The era of Society 5.0 presents new challenges for teacher professionalism in utilizing digital technology. Teachers in this era are required not only to master the subject matter but also to develop skills in leveraging technology to enhance learning effectiveness.⁴⁸

⁴⁵ Hariyono Hariyono et al., *Perkembangan Peserta Didik: Teori Dan Implementasi Perkembangan Peserta Didik Pada Era Digital* (PT. Sonpedia Publishing Indonesia, 2024).

⁴⁶ Dearda Yulia Mayona, Dwi Purbowati, and Amining Rahmasiwi, "The Relationship between Parent's Attention and Learning Motivation of Elementary School Students during the Pandemic Period," *JENIUS (Journal of Education Policy and Elementary Education Issues)* 3, no. 2 (December 2022): 70–80, <https://doi.org/10.22515/jenius.v3i2.5345>.

⁴⁷ Firda Laila Syahda, Yuniaridha Nur'aisyah, and Ichsan Fauzi Rachman, "Pentingnya Pendidikan Etika Digital Dalam Konteks SDGs 2030," *Perspektif: Jurnal Pendidikan Dan Ilmu Bahasa* 2, no. 2 (May 28, 2024): 66–80, <https://doi.org/10.59059/perspektif.v2i2.1259>.

⁴⁸ M Zainal Arifin and Agus Setiawan, "Strategi Belajar Dan Mengajar Guru Pada Abad 21," *Indonesian Journal of Instructional Technology* 1, no. 2 (2020),

Additionally, technology-based educational approaches must continue to consider humanistic aspects so that students develop technical skills and cultivate strong ethical and moral values.⁴⁹ The main challenges in improving teacher professionalism include adapting to digital technology, addressing digital literacy gaps, and overcoming technological access limitations in various regions. Therefore, appropriate strategies are necessary to enable teachers to navigate these changes optimally.⁵⁰

The findings of this study indicate that teacher professionalism in the era of Society 5.0 depends on five key aspects: digital technology comprehension, 21st-century competency development, humanistic learning approaches, capacity building through continuous learning, and collaboration with various educational stakeholders. These findings underscore the importance of integrating technology into learning while maintaining humanistic aspects in teacher-student interactions. Furthermore, capacity building through training and workshops has proven an effective strategy for enhancing teacher professionalism. However, this study also found that digital literacy gaps among teachers could impact the effectiveness of technology integration in learning. The increasing complexity of teachers' tasks in this era is another challenge that requires appropriate educational policy support.

These findings align with previous research highlighting the importance of digital literacy training for teachers in addressing educational challenges in the Society 5.0 era.⁵¹ Other studies have also demonstrated that 21st-century competencies, such as critical thinking, communication, and collaboration, are key in supporting technology-based learning.⁵² However, this study adds that humanistic learning approaches should remain a top priority in implementing digital technology in schools. This contrasts with the findings of Dermawan & Sumarni, who emphasized technology accessibility challenges without considering the pedagogical aspects of technology integration.⁵³ Therefore, this study contributes by emphasizing the balance between technological competence and humanistic educational values.

One factor explaining the challenges of teacher professionalism in the Society 5.0 era is the disparity in access to digital technology across different regions. In some areas, limited infrastructure and digital learning facilities pose major obstacles to implementing technology-based education.⁵⁴

Additionally, not all teachers have the same level of readiness to face digital transformation, leading to digital literacy gaps between teachers who are already accustomed to technology and those who are not.⁵⁵ This factor affects the effectiveness of the learning process and creates educational quality imbalances between regions.⁵⁶

<https://journal.kurasinstitute.com/index.php/ijit/article/view/45>.

⁴⁹ Husna et al., "Transformasi Peran Guru Di Era Digital: Tantangan Dan Peluang."

⁵⁰ Husna et al.

⁵¹ Mudarris, "Profesionalisme Guru Di Era Digital; Upaya Dalam Meningkatkan Mutu Lembaga Pendidikan."

⁵² Eliwatis et al., "Challenges of Society Era Education 5.0: Revitalization of Teacher Competencies and Learning Models."

⁵³ Dermawan and Sumarni, "Basic Education in the Era of Society 5.0: Opportunities and Challenges."

⁵⁴ Hellen Tiara and Danu, "Epistemology of Islamic Education: Criticism and Alternative Solutions," *HEUTAGOGIA: Journal of Islamic Education* 3, no. 1 (June 30, 2023): 115–26, <https://doi.org/10.14421/hjie.2023.31-09>.

⁵⁵ Akhmad Dahlan, *Literasi Digital Akademik*, Hanif Al-F (Makassar, Sulawesi Selatan: Tohar Media, 2024).

⁵⁶ Jefri Ronald Parulian Siagian, "Meningkatkan Sumber Daya Manusia Yang Berdaya Saing Di Era Teknologi Digital Guna Mendukung Transformasi Digital Nasional" (Lemhannas RI, 2024), <http://lib.lemhannas.go.id/opac/detailopac/17245>.

Therefore, inclusive and continuous training programs must ensure that all teachers have equal opportunities to enhance their professionalism.

Another crucial aspect of improving teacher professionalism is the combination of humanistic learning approaches with technology. The use of technology in education must continue to uphold moral and ethical values so that students not only become technically skilled individuals but also develop strong character.⁵⁷ Teachers are vital in guiding students to use technology wisely and responsibly. Therefore, strategies for enhancing teacher professionalism should focus on technological mastery and strengthening the teacher's role as an educator who shapes students' character in the digital era. Thus, the development of teacher professionalism must simultaneously encompass pedagogical, ethical, and digital literacy aspects.

Beyond the existing challenges, this study also highlights the importance of collaboration between teachers, schools, and the community in enhancing teacher professionalism in the Society 5.0 era. Support from various stakeholders, including the government and educational institutions, is essential in providing adequate facilities and training for teachers.⁵⁸ Through such collaboration, teachers can more easily access the necessary resources to improve their competencies in technology-based learning. Additionally, technology-based educational supervision, such as e-supervision, can serve as a solution to enhance the effectiveness of teacher supervision and professional development.⁵⁹ Therefore, cooperation among stakeholders is a strategic step in addressing educational challenges in the digital era.

The implications of this study suggest that improving teacher professionalism in the Society 5.0 era must be carried out through a holistic approach. Governments and educational institutions need to establish policies that support continuous teacher training and ensure the availability of adequate digital infrastructure across all regions. Moreover, the development of teacher professionalism should include strengthening 21st-century skills, integrating technology with humanistic approaches, and enhancing digital literacy among educators. With the right strategies, teachers can be better prepared to face educational challenges in the Society 5.0 era and contribute to creating more innovative, inclusive, and high-quality learning environments.

4. Conclusion

This study analyzes the challenges faced by teachers in the Society 5.0 era and identifies strategies to enhance their professionalism. The findings highlight that this era demands a more flexible, innovative, and technology-driven education system, requiring teachers to integrate technology into learning in a human-centered manner. Beyond possessing strong digital literacy, teachers must also guide students in using technology responsibly and ethically. The research identifies five key aspects of improving teacher professionalism: understanding digital technology, developing 21st-century competencies, adopting a humanistic approach to learning, engaging in continuous professional development, and fostering collaboration with educational stakeholders.

⁵⁷ Ulya Amelia, "Tantangan Pembelajaran Era Society 5.0 Dalam Perspektif Manajemen Pendidikan," *Al-Marsus : Jurnal Manajemen Pendidikan Islam* 1, no. 1 (June 30, 2023): 68, <https://doi.org/10.30983/al-marsus.v1i1.6415>.

⁵⁸ Arif Ismunandar and Aang Kurnia, "Peningkatan Kemampuan Pendidikan Di Era Society 5.0," *Jurnal Review Pendidikan Dan Pengajaran (JRPP)* 6, no. 2 (August 2023): 388–97, <https://doi.org/10.31004/jrpp.v6i2.18234>.

⁵⁹ Ikhwanul Muslimin, "Meningkatkan Profesionalisme Guru Dengan Model, Pendekatan, Dan Teknik Supervisi Pendidikan Di Era Society 5.0," *An-Nahdliyah: Jurnal Manajemen Pendidikan Islam* 2, no. 1 (2023): 69–95.



However, significant challenges persist, including adapting to digital advancements, bridging literacy gaps, managing complex teaching responsibilities, addressing technological access disparities, and meeting ongoing competence development demands. Effective strategies to enhance teacher professionalism must consider these challenges to support educational transformation in this era.

The implications of this study emphasize the need for a holistic and sustainable approach to improving teacher professionalism. Governments and educational institutions should implement systematic teacher training policies and ensure adequate digital infrastructure across all regions. Strengthening 21st-century skills, integrating technology with a humanistic approach, and enhancing digital literacy among educators are essential steps. By addressing these factors, teachers will be better prepared to navigate the evolving educational landscape and contribute to creating innovative, inclusive, and high-quality learning experiences. Despite offering comprehensive insights, this study has certain limitations, primarily focusing on theoretical and conceptual aspects. Further research is needed to examine the practical implementation of these strategies, considering variations in social conditions and educational infrastructure. Future studies should conduct case analyses in various academic institutions to assess the real-world effectiveness of teacher professionalism enhancement strategies. Additionally, exploring the role of educational policies in supporting teachers' digital transformation remains an important research agenda. More in-depth, data-driven investigations will help refine these strategies, ensuring they align with teachers' specific needs and challenges.

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