Jurnal Teknologi Pendidikan, April 2025, 27 (1), 25-34
DOI: http://dx.doi.org/10.21009/JTP2001.6
p-ISSN: 1411-2744 e-ISSN: 2620-3081
Accredited by Directorate General of Strengthening for Research and Development
Available online at http://journal.unj.ac.id/unj/index.php/jtp

Curriculum Management in The Era of Industrial Revolution 4.0: A Literature Analysis of Curriculum Change and Adaptation

Darmawati[1(*)], Lilik Hidayat Pulunga[2]
[1,2]Faculty of Teacher Training and Education, Universitas Muhammadiyah Sumatera Utara, Medan, Indonesia

Received : April 9, 2025
Revised : April 12, 2025
Accepted : April 30, 2025

Abstract

The development of the Industrial Revolution 4.0 requires the education system to continue to adapt to technology and dynamic social changes. The curriculum as the foundation of education undergoes various changes to adapt to industry needs and global demands. This research aims to analyze curriculum changes in Indonesia through literature studies, focusing on the comparison between the 2013 Curriculum, Merdeka Curriculum, and the latest National Curriculum. The method used is a bibliometric approach with data analysis from various academic sources and educational policies. This method aims to analyze academic sources and policies in education. The data were collected from reputable journals, academic books, and policies related to education. The analysis techniques used include content analysis and data visualization using VOSviewer software to identify related research trends with research samples taken from articles in the Scopus and Web of Science databases in the last 10 years to understand the dynamics of curriculum change. In addition, interviews with 10 secondary school teachers were conducted to gain perspectives on the challenges of curriculum implementation. The results show that the 2013 Curriculum still tends to be rigid and less flexible, while the Merdeka Curriculum provides more freedom in learning design. The newly designed National Curriculum, Merdeka Belajar curriculum, is used to integrate digital technology and 21st century skills, but is still in the early stages of implementation. The impact of these changes on teachers includes increased demands on digital and pedagogical competencies, while for students, a more flexible curriculum provides learning opportunities that better suit individual needs. The study recommends improved teacher training, equitable distribution of digital infrastructure, and collaboration between schools, industry and government in curriculum design.

Keywords: *Curriculum Management; Industrial Revolution 4.0; 2013 Curriculum; Merdeka Curriculum; National Curriculum*

(*) Corresponding Author darmawati@umsu.ac.id

How to Cite: Darmawati, & Pulungan, L. H. (2025). Curriculum Management in The Era of Industrial Revolution 4.0: A Literature Analysis of Curriculum Change and Adaptation. *JTP - Jurnal Teknologi Pendidikan*, *27*(1), 25–34. https://doi.org/10.21009/jtp.v27i1.54444

INTRODUCTION

The Industrial Revolution 4.0 has brought significant changes in various aspects of life, including in education. Digital transformation and technological developments such as artificial intelligence (AI), Internet of Things (IoT), and big data demand changes in the education system, especially in curriculum management. The curriculum that was previously based on conventional methods must now adapt to the needs of a digital and dynamic era (Siahaan et al., 2023). According to (Tilaar, 2007), the curriculum must always be dynamic and able to respond to the challenges of the times. This is in line with the opinion of (Rawi et al., 2023) which states that curriculum changes should be based on the

needs of society and technological developments. Meanwhile, (Muttaqin, 2018) emphasizes the importance of innovation in learning to keep the curriculum relevant.

However, in its implementation, curriculum adaptation in the era of the Industrial Revolution 4.0 faces various challenges. Some of the main problems include the technology gap between urban and rural areas, the lack of readiness of educators in adopting technology, and the imbalance between the needs of the industrial world and the existing education system (Mulyana, 2014). As (Voogt, J., & Roblin, 2012) point out, technology integration in the curriculum requires careful planning and support from various stakeholders.

The Industrial Revolution 4.0 brings new challenges in the world of education, which requires changes and adaptations to the curriculum to suit technological developments and industry needs. Education in this era must be able to produce graduates who have digital competencies, critical thinking, and are able to adapt to a dynamic environment (Hendayani, 2019). In the Indonesian context, curriculum changes have occurred several times, including the 2013 Curriculum, Merdeka Curriculum, and the latest policy known as the National Curriculum (Darmadi, 2015). MoECristek develops Merdeka Curriculum as part of the national curriculum to promote learning recovery during the Covid-19 pandemic (Rozady & Koten, 2021). The main problem in curriculum management in the era of the Industrial Revolution 4.0 is how educational institutions can manage and adapt the curriculum to keep it relevant and in line with the demands of 21st century skills (Mahrus, 2021; Siahaan et al., 2023). A curriculum that is too static risks becoming obsolete and unable to produce graduates who are ready to face global challenges (Mulyasa, 2007). Therefore, an in-depth analysis of the literature is needed to understand the changes that occur and the adaptation strategies that can be applied in curriculum management.

The curriculum as the core of the education system must be able to adapt to the demands of the times. Various literature shows that there is a gap between the conventional curriculum and the increasingly complex needs of the digital era. The traditional curriculum that emphasizes more on cognitive aspects needs to transform into a curriculum that is more flexible, competency-based, and integrates digital technology in learning. Curriculum change in the context of the Industrial Revolution 4.0 can be analyzed through several approaches, such as constructivism theory that emphasizes experiential learning, change management theory that explains how the education system can manage change effectively, and technology-based education theory that highlights the role of digitalization in the learning process (Aminah & Sya'bani, 2023; Supriyanto, 2018). With reference to these theories, this literature review aims to identify adaptation strategies that can be applied in curriculum management to ensure education remains relevant and able to produce competitive graduates.

Curriculum change is a dynamic process that is influenced by various factors, including government policies, technological developments, and the needs of learners. According to (Tyler, 1949), the curriculum must have clear objectives, structured learning experiences and effective evaluation methods. In the Indonesian context, curriculum changes are made to respond to the challenges of the times and increase the relevance of education to the world of work. There are fundamental things that make the curriculum in Indonesia comparable. In the 2013 curriculum, it is applied nationally by emphasizing the scientific learning approach, where students are invited to observe, question, try, reason, and communicate their learning results (Mulyasa, 2007). As for the independent curriculum, it provides flexibility to education units in designing more personalized and project-based learning (Kemendikbud, 2021). Meanwhile, in the national curriculum (latest), designed to adapt education to the needs of industry and technological developments, although its implementation is still in its early stages since March 26, 2024, the Ministry of Education and Culture has determined that the current curriculum is named

the national curriculum with a deep learning approach with mindful, meaningful, and joyful priorities. This is stated in the Minister of Education and Culture Regulation No. 12 of 2024 (Setiawan, 2023).

Theoretically, curriculum change is based on the theory of constructivism (Suparlan, 2019) which emphasizes that learners construct their own understanding through learning experiences. Conceptually, curriculum change aims to improve the quality of education to align with global demands. However, in reality, curriculum implementation often faces various obstacles, such as teachers' readiness to adapt the new curriculum, limited infrastructure, and resistance to change (Aayn & Listiadi, 2022; Cholilah et al., 2023). Through this literature analysis, it is hoped that a more in-depth understanding of the challenges and opportunities in curriculum management in the era of the Industrial Revolution 4.0 can be obtained as well as providing recommendations for educational institutions in dealing with evolving changes. Therefore, this study aims to analyze curriculum changes in Indonesia in the context of the Industrial Revolution 4.0.

Based on this background, this research aims to analyze various literatures related to curriculum change and adaptation in the era of the Industrial Revolution 4.0. The main focus in this study is how the education system can design a curriculum that is flexible, innovative, and able to prepare students to face future challenges.

METHODS

This research uses a bibliometric approach to analyze various literatures related to curriculum change in Indonesia. Data were collected from reputable journals, academic books, and education policies. The analysis techniques used included content analysis and data visualization using VOSviewer software to identify related research trends (Van Eck & Waltman, 2010). Research samples were taken from articles in the Scopus and Web of Science databases in the last 10 years to understand the dynamics of curriculum change. In addition, interviews with 10 secondary school teachers were conducted to gain perspectives on the challenges of curriculum implementation. The research sample was drawn from articles in the Scopus and Web of Science databases in the last 10 years to understand the dynamics of curriculum change. In addition, interviews with 10 secondary school teachers were conducted to gain perspectives on the challenges of curriculum implementation. The 10 secondary school teachers were selected on the basis of being representatives from private and public schools whose school identities were concealed. Then, after ten (10) teachers were selected, in-depth interviews were conducted. Then, the data obtained through various literatures such as reputable journals, academic books, and education policy regulations were analyzed.

RESULTS & DISCUSSION

a. Curriculum 2013

Curriculum 2013 is rigid and lacks the flexibility to adapt learning to individual needs. The following table shows that Curriculum 2013 (K-13) is considered rigid and inflexible compared to more adaptive curriculum approaches. The research also shows that secondary school teachers have difficulty in adapting the rigid curriculum into daily learning. They feel limited in providing space for learning that is more tailored to students' needs and interests. Therefore, there is a need to improve the preparation of a more flexible and adaptive curriculum in order to improve the quality of learning in secondary schools. It is hoped that the results of this study can make a positive contribution to curriculum

development that is more in line with the needs of education in the current era. A detailed example related to this is when a teacher in a secondary school finds it difficult to teach material that suits the interests and needs of his students because he is bound by a rigid curriculum. As a solution, the teacher tries to create more interactive and project-based learning in order to increase student involvement and meet individual needs. Furthermore, the characteristics of Curriculum 2013 are shown in the following table.

Table 1. Rigid and Inflexible Characteristics of the 2013 Curriculum

Aspects	Characteristics of K-13 (Rigid & Inflexible)	Ideally Flexible Curriculum
Structure of curiculum	Subjects and time allocations are strictly defined.	Can be customized according to student needs and school conditions.
Learning Methods	Emphasizes the scientific approach uniformly.	Accommodate various learning models that are appropriate to the local context.
Assessment	Oriented to strict national standards (KKM scores, mandatory tests, certain portfolios).	More flexibility in assessment methods according to learner characteristics.
Learning Materials	A textbook that must be followed systematically without much modification.	Allows teachers to customize materials based on student needs.
Teacher Involvement	Teachers must follow the prescribed format of lesson plans and syllabus.	Teachers have freedom in developing lesson plans and learning strategies.
Konteks Local	The curriculum lacks consideration of local conditions and culture.	More adaptive to regional social and cultural conditions.
Learner Preparation	Focuses on academic competencies without much room for 21st century skills such as creativity and collaboration.	Develop skills that are more relevant to the world of work and real life (Shodiq, 2024)

Source: (Shodiq, 2024)

The conclusion based on the table of characteristics of the 2013 curriculum shows that the implementation of this curriculum must be accompanied by an awareness of the importance of adaptation to local social and cultural conditions. Teachers need to have the freedom to design learning strategies that are relevant to the needs of learners, including integrating 21st century skills such as creativity and collaboration. This can help learners develop skills that are more relevant to the world of work and real life, so that they are able to compete and succeed in an ever-changing and evolving environment.

b. Independent Curriculum

The Merdeka Curriculum provides more flexibility in determining learning methods but still faces implementation challenges in regions with limited resources (Widodo, 2022). In addition, it is also necessary to consider how to involve industry and the world of work in the learning process, so that students are truly prepared to face the

demands of the world of work after graduation. The implementation of Merdeka Curriculum must also pay attention to the role of teachers as learning facilitators who are able to accommodate students' individual needs in order to reach their maximum potential. For example, in rural areas with limited access to technology and the internet, implementing the Merdeka Curriculum can be difficult because students cannot get online learning effectively. In addition, involving industry in the learning process can also be difficult in areas with few economic resources due to the lack of opportunities to interact with the world of work.

In the context of advancing globalization, it is important for educators to pay attention to the challenges that may arise in implementing the Merdeka Curriculum. Nonetheless, efforts to continue to encourage the integration of 21st century skills remain a necessary step for the development of a generation that is resilient and ready to compete in the digital era. By identifying the tangible benefits of implementing this curriculum, education stakeholders can jointly create solutions to overcome the obstacles. The following table shows the implementation challenges and human resource limitations in implementing the Merdeka Curriculum.

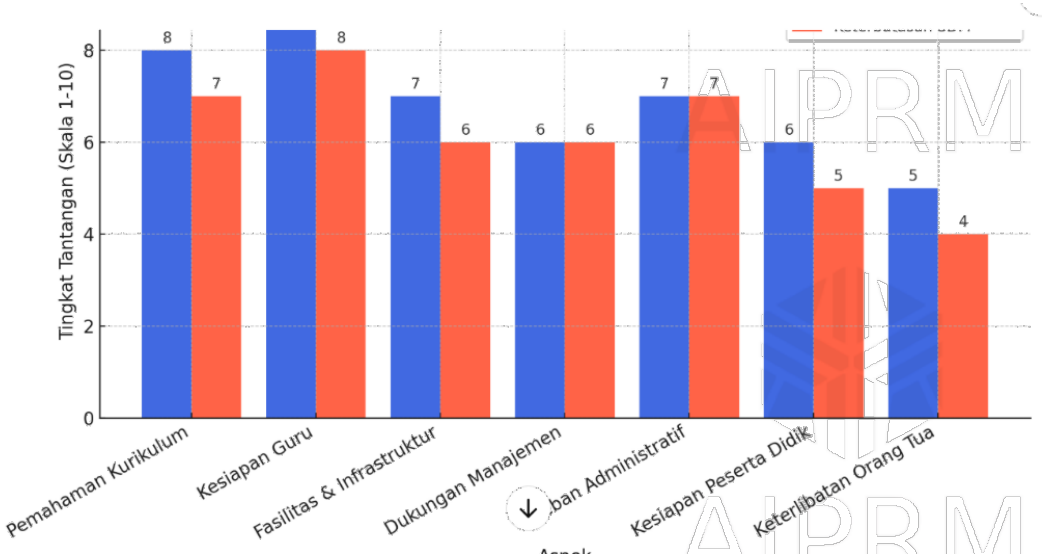
Table 2. Implementation Challenges and Limited Human Resources in the Merdeka Curriculum

Aspects	Implementation Challenges	Limited Human Resources (HR)
Curriculum Understanding	Many teachers still do not understand the concept and philosophy of the Merdeka Curriculum..	Teachers need intensive training to optimally implement the curriculum.
Teacher Readiness	Not all teachers are ready to teach with a differentiated approach and project-based learning.	Lack of teacher skills in developing appropriate teaching modules and assessments.
Facilities and Infrastructure	Schools in disadvantaged areas have limited access to technology and learning resources.	Teachers do not have adequate access to digital devices and the internet.
School Management Support	Not all school principals and education personnel understand the Merdeka Curriculum implementation strategy.	Limited training for principals to become innovative learning leaders.
Teacher Administrative Load	Teachers are still burdened by administration that hampers innovation in learning.	Lack of administrative personnel to assist teachers' non-teaching duties.
Learner Readiness	Learners need to adapt to more independent learning methods.	Not all students have strong literacy and numeracy skills to support this learning model.
Parental Involvement	Lack of parents' understanding of their role in supporting project-based learning.	Not all parents have the time and resources to support their children's learning

Source: (Rahman, 2023)

The challenges of implementing the Merdeka Curriculum also involve the limited human resources (HR) needed to manage this learning model. Administrative personnel are needed who can assist teachers' non-teaching tasks, but not all schools have adequate human resources for this. In addition, the readiness of students to adapt independent learning methods is also an important factor, especially for students who do not have adequate literacy and numeracy skills. All parties, including parents, must also be actively involved in supporting project-based learning, but parental involvement is often constrained by a lack of understanding and limited time and resources. Thus, implementing Merdeka Curriculum requires collaborative efforts from various parties to overcome the challenges and limitations that arise. In addition, the challenges in implementing the Merdeka curriculum are also explained in the following chart.

Graph 1: Implementation Challenges and Limited Human Resources (HR) in Implementing the Independent Curriculum



Sumber: (Widodo, 2022)

The blue color represents implementation challenges.

Red color indicates limited human resources.

c. National Curriculum

This curriculum basically still adopts the 2013 curriculum and the Merdeka curriculum. This national curriculum is more oriented towards 21st century skills and integrates digital technology in learning, but has not been fully adopted by all educational units (Putra, 2024), with a deep learning approach: mindful, meaningful, and joyful. The deep learning approach is a learning approach that emphasizes mastery of material in a deep and meaningful way, and is done with joy. This approach involves a more thorough and holistic learning process, where students not only understand concepts mechanically, but are also able to relate them to personal experiences and the real world. It also encourages students to consider the moral and ethical implications of the knowledge they learn, so as to encourage them to act wisely in their daily lives. By applying the deep learning approach, students are expected to develop deeper understanding, critical thinking skills, and emotional intelligence that can help them succeed in the future.

Through this holistic approach, students are expected to see the connection between the knowledge they acquire and their daily lives, so that they can make more

informed and responsible decisions. Thus, they will not only become academically smart individuals, but also have strong emotional intelligence. Thus, the deep learning approach becomes an important foundation in preparing students to face future challenges and opportunities. Here is a table of the National Curriculum implementation oriented towards skill development and the integration of digital technology in learning:

Table 3. Implementation of the National Curriculum in Skills Development and Technology Integration

Aspects	Implementation in the National Curriculum
Digital Technology Integration	Use of Learning Management System (LMS), interactive learning applications, and digital media in the teaching and learning process.
21st Century Skills	Focuses on developing creativity, collaboration, communication, and problem solving through project-based and inquiry learning.
Teacher Readiness	Teacher training in the use of educational technology and innovative digital-based learning methods.
Digital Access	Provision of digital infrastructure such as internet, hardware (computers, tablets), and digital learning resources for schools.
Evaluation and Assessment	Utilization of technology-based assessments (CBT - Computer Based Test) and digital portfolios to assess student competencies more holistically.
Data-driven Learning	Utilization of data analytics in learning to tailor materials to individual student needs.
Connectivity with Industry	Collaboration with industry to provide practice-based learning experiences through internships, industrial projects, and work-based learning.

Source: (Putra, 2024)

This table illustrates how the National Curriculum is implemented to prepare learners with 21st century skills as well as ensuring the utilization of digital technology in learning. The impact of these changes on teachers includes increased demands on digital and pedagogical competencies, while for students, a more flexible curriculum allows for learning that better suits their interests and talents.

Referring to the results of the research that has been carried out, it can be presented in the form of comparison tables, curriculum change trend charts, and bibliometric network diagrams. The following is a comparison table of the three main curricula in Indonesia:

Table 4. Implementation of the National Curriculum in Skills Development and Technology Integration

Aspects	Currency exchange rate 2013	Independent Curriculum	National Curriculum
Challenge	Scientific Learning	Pembelajaran berbasis proyek	Integrasi teknologi & keterampilan abad 21
Flexibility	Less flexible	More flexible	Industry needs-oriented
Approach	High administrative burden	Lack of teacher training	Still in the early stages of implementation

Source: Processing results of literature study data (2025)

2013 Curriculum, Education Unit Level Curriculum (KTSP), and Merdeka Belajar Curriculum. The table shows the fundamental differences between the three curricula, from

the structure and objectives to the learning methods. The curriculum change trend graph also shows the evolution of the curriculum in Indonesia over time, in line with technological developments and learner needs. In addition, the bibliometric network diagram illustrates the relationship between various concepts and theories that form the basis of curriculum formation in Indonesia. With this data, it is expected to provide a clear picture of the development of the education curriculum in Indonesia and the direction it will take in the future. However, curriculum changes must also be considered from the point of view of implementation in the field, including the availability of resources and training for educators in order to implement the curriculum properly. In addition, external factors such as social, economic and cultural conditions also need to be taken into account in designing a curriculum that meets the needs of learners.

Therefore, continuous evaluation of curriculum implementation is essential to identify bottlenecks and adjust the curriculum to make it more relevant and effective. In addition, active participation from all stakeholders, including teachers, parents and communities, is also needed to support successful curriculum implementation. Thus, with a holistic and collaborative approach, it is expected that the education curriculum in Indonesia can continue to evolve in accordance with the demands of the times and the needs of learners.

CONCLUSION

The study concluded that curriculum adaptation in Indonesia continues to evolve to meet the challenges of the Industrial Revolution 4.0. A more flexible and technology-based curriculum is needed so that students are prepared to face an increasingly competitive world of work. Recommendations for policy makers include: a) Increased teacher training in the use of educational technology. A more holistic and collaborative curriculum development is expected to provide more relevant and in-depth learning experiences for students. In addition, policy makers also need to pay attention to the integration of technology in the learning process so that students can develop skills that are in line with current industry needs. Thus, Indonesia can continue to improve its education system to produce competent human resources who are ready to compete in the global market, b) Equitable development of digital infrastructure in all regions. Provide fair and equitable access to technology for all students, so that individual potential can be better explored. Thus, there is no gap in the utilization of technology that can affect the ability of students to compete in this digital era. With the achievement of this goal, Indonesia is expected to present a generation that is ready to face global changes and challenges with confidence and competence

And third strengthening collaboration between schools, industry and government in curriculum development. Collaboration between schools, industry and government is also needed in developing a curriculum that is relevant to the demands of the digital era. Thus, students can gain knowledge and skills that are in line with market needs. In addition, the existence of equitable digital infrastructure in all regions will also increase the accessibility of education for all communities, so that individual potential can be optimally developed. With these steps, Indonesia is expected to become a superior country in facing the digital era and globalization. With this strategic step, it is hoped that the Indonesian education system can be more adaptive to the challenges of the times and produce graduates who are more competitive in the era of the Industrial Revolution 4.0.

REFERENCES

Aayn, S. L., & Listiadi, A. (2022). Pengaruh Pengenalan Lapangan Persekolahan, Persepsi Profesi Guru dan Efikasi Diri Terhadap Kesiapan Menjadi Guru (Mahasiswa Program Studi Pendidikan Akuntansi UNESA). *Jurnal Studi Guru Dan Pembelajaran*, *5*(1), 132–140. https://e-journal.my.id/jsgp/article/view/1738/1416

Aminah, I. A. N., & Sya'bani, M. A. Y. (2023). Implementasi Kurikulum Merdeka Dalam Pembelajaran Pendidikan Agama Islam. *Jurnal Pendidikan Islam Al-Ilmi*, *6*(2), 293–303. https://doi.org/https://doi.org/10.32529/al-ilmi.v6i2.2804

Cholilah, M., Tatuwo, A. G. P., Komariah, Rosdiana, S. P., & Fatirul, A. N. (2023). Pengembangan Kurikulum Merdeka Dalam Satuan Pendidikan Serta Implementasi Kurikulum Merdeka Pada Pembelajaran Abad 21. *Sanskara Pendidikan Dan Pengajaran*, *1*(2), 56–67. https://doi.org/https://doi.org/10.58812/spp.v1i02.110

Darmadi, H. (2015). Tugas, Peran, Kompetensi, Dan Tanggung Jawab Menjadi Guru Profesional. *Jurnal Edukasi*, *13*(2).

Hendayani, M. (2019). Problematika Pengembangan Karakter Peserta Didik di Era 4.0. *Jurnal Penelitian Pendidikan Islam*, *7*(2), 183.

Kemendikbud. (2021). *Kebijakan Kurikulum Merdeka. Jakarta:* Kementerian Pendidikan dan Kebudayaan.

Mahrus. (2021). Manajemen Kurikulum dan Pembelajaran dalam Sistem Pendidikan Nasional. *JIEMAN: Journal of Islamic Educational Management*, *3*(1), 41–80. https://doi.org/https://doi.org/10.35719/jieman.v3i1.59

Mulyana. (2014). Peningkatan kapabilitas inovasi, keunggulan bersaing dan kinerja melalui pendekatan quadruple helix: Studi pada industri kreatif sektor fashion. *Jurnal Manajemen Teknologi*, *13*(3), 304–321.

Mulyasa, E. (2007). *Kurikulum Tingkat Satuan Pendidikan*. Remaja Rosdakarya.

Muttaqin, M. T. (2018). *INOVASI PEMBELAJARAN PAI BERBASIS MULTIPLE INTELLIGENCES.* file:///C:/Users/Admin/Downloads/M.pdf

Putra, H. (2024). *Adaptasi Kurikulum Nasional dalam Era Digital*. Rosdakarya.

Rahman, M. A. (2023). *Tantangan dan Solusi Dalam Implementasi Program Kebijakan "Merdeka Belajar, Kampus Merdeka"(MBKM) di Perguruan Tinggi.* https://osf.io/preprints/thesiscommons/m32va/

Rawi, H. W., Salsabila, A., Ainun, N., Harahap, N., Akmalia, R., Lubis, S. P., & Rachman, S. (2023). Peralihan Kurikulum 2013 Menjadi Kurikulum Merdeka Pada Siswa Sma Melalui Inovasi Pendidikan. *Jurnal Pendidikan Dan Konseling (JPDK)*, *5*(2), 5969–5976. https://doi.org/https://doi.org/10.31004/jpdk.v5i2.16093

Rozady, M. P., & Koten, Y. P. (2021). Scratch sebagai Problem Solving Computational Thinking dalam Kurikulum Prototipe. *Increate-Inovasi Dan Kreasi Dalam Teknologi Informasi*, *8*(1), 11–17.

Setiawan, B. (2023). *Pendidikan di Era Revolusi Industri 4.0*. Deepublish.

Shodiq, J. (2024). Kurikulum Berbasis Kompetensi di Sekolah. *Andragogi: Jurnal Pendidikan Islam Dan Manajemen Pendidikan Islam*, *6*(3), 240–251. https://doi.org/https://doi.org/10.36671/andragogi.v6i3.959

Siahaan, A., Supardi, S., Wardani, W., Fauzi, Z. A., Hasibuan, P. M., & Akmalia, R. (2023). Manajemen Kurikulum dalam Meningkatkan Mutu Pendidikan. *Journal on Education*, *5*(3), 9189–9196. https://doi.org/https://doi.org/10.31004/joe.v5i3.1723

Suparlan. (2019). Teori konstruktivisme dalam pembelajaran. *Islamika*, *1*(2), 79–88. https://doi.org/10.36088/islamika.v1i2.208

Supriyanto, E. (2018). *Desain Kurikulum Berbasis SKS dan Pembelajaran untuk Sekolah Masa Depan*. Muhammadiyah University Press.

Tilaar, H. A. . (2007). *Mengindonesia Etnisitas dan Identitas Bangsa Indonesia: Tinjauan*

dari Perspektif Ilmu Pendidikan. Rineka Cipta.

Tyler, R. W. (1949). *Basic Principles of Curriculum and Instruction*. University of Chicago Press.

Van Eck, N., & Waltman, L. (2010). Software survey: VOSviewer, a computer program for bibliometric mapping. *Scientometrics*, *84*(2), 523–538. https://doi.org/https://doi.org/10.1007/s11192-009-0146-3

Voogt, J., & Roblin, N. P. (2012). A comparative analysis of international frameworks for 21st century competences: Implications for national curriculum policies. *Journal of Curriculum Studies*, *44*(3), 299–321. https://doi.org/https://doi.org/10.1080/00220272.2012.668938

Widodo, S. (2022). *Implementasi Kurikulum Merdeka dalam Konteks Pendidikan Indonesia*. Unesa Press.