



## Teacher competence development in Kurikulum Merdeka implementation: A literature study

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### ABSTRACT

The Kurikulum Merdeka is an innovation in the world of education that requires teachers to play an active role in developing their competencies. This article aims to analyze the concept and model of teacher competency development, factors influencing teacher competency development, and effective strategies or methods for developing teacher competency in implementing the Kurikulum Merdeka. This article uses a qualitative descriptive research method by collecting literature from various sources that discuss teacher competence development. These factors influence teacher competence development and effective strategies or methods for developing teacher competence in implementing the Kurikulum Merdeka. Several significant findings from this literature review include that teachers have a strategic role in developing all aspects of human personality and abilities. Effective strategies and methods for developing teacher competency are also written, including training and development, collaboration and sharing, and the use of technology in learning. From these findings, it can be concluded that developing teacher competence in implementing the Kurikulum Merdeka requires understanding the concepts and types of teacher competence. These factors influence teacher competence development and effective strategies or methods for developing teacher competence. Hopefully, this article can provide insight and recommendations for educational practitioners in developing teacher competency in the Kurikulum Merdeka era.

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### ABSTRAK

Kurikulum Merdeka Belajar merupakan inovasi dalam dunia pendidikan yang menuntut peran aktif guru dalam mengembangkan kompetensi mereka. Artikel ini bertujuan untuk menganalisis konsep dan model pengembangan kompetensi guru, faktor-faktor yang mempengaruhi pengembangan kompetensi guru, serta strategi atau metode yang efektif untuk mengembangkan kompetensi guru dalam implementasi Kurikulum Merdeka. Artikel ini menggunakan metode penelitian kualitatif deskriptif dengan mengumpulkan berbagai literatur dari berbagai sumber yang membahas tentang pengembangan kompetensi guru, faktor-faktor yang mempengaruhi pengembangan kompetensi guru, dan strategi atau metode yang efektif untuk mengembangkan kompetensi guru dalam implementasi Kurikulum Merdeka. Beberapa temuan penting dari kajian literatur ini antara lain guru memiliki peran strategis dalam mengembangkan seluruh aspek kepribadian dan kemampuan manusia. Selain itu dituliskan juga strategi dan metode yang efektif untuk mengembangkan kompetensi guru antara lain pelatihan dan pengembangan, kolaborasi dan sharing, serta penggunaan teknologi dalam pembelajaran. Dari temuan-temuan tersebut, dapat disimpulkan bahwa pengembangan kompetensi guru dalam implementasi Kurikulum Merdeka memerlukan pemahaman tentang konsep dan jenis-jenis kompetensi guru, faktor-faktor yang mempengaruhi pengembangan kompetensi guru, serta strategi atau metode yang efektif untuk mengembangkan kompetensi guru. Artikel ini diharapkan dapat memberikan wawasan dan rekomendasi bagi para praktisi pendidikan dalam mengembangkan kompetensi guru dalam era Kurikulum Merdeka.

**Kata Kunci:** Implementasi kurikulum; kompetensi digital; kompetensi guru; Kurikulum Merdeka.

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## INTRODUCTION

Kurikulum Merdeka is a new curriculum in Indonesia that aims to give more flexibility and autonomy to schools and teachers. However, the implementation of this curriculum has faced some challenges, especially concerning the digital competence of teachers. The law on the national education system states that the development of programs is carried out in the light of national educational standards to national education. According to a book titled “*Manajemen Kurikulum*” by Rusman, curriculum implementation will be influenced by a new paradigm in education. Professional, qualified, and competent human resource support from the head of the school, teachers, and other educational staff is required for the implementation of the curriculum in the school. Without a change in the teacher himself, it's impossible to make curriculum modifications. The key determinant of the success or failure of the implementation of the curriculum is the availability and ability of the human resources during its implementation, in this case, the teacher. The strategy for the teacher competence criteria is to enhance teachers' competence in terms of these demands as well as advances in science, technology, and art.

In an article by Sekretariat KSPSTK, one of the challenges in implementing the Kurikulum Merdeka is the lack of digital skills. Many teachers do not have the digital skills needed to effectively implement the Kurikulum Merdeka, which relies heavily on technology. This can cause difficulties in using digital tools and resources and adapting to new teaching methods. In other research, some teachers are resistant to change and prefer traditional teaching approaches over the new ones required by the Kurikulum Merdeka (Legi *et al.*, 2023). In fact, a study states that teachers should improve and develop their superior professional competencies, with existing competencies able to make teachers professional (Saihu, 2020). Teachers need various skills and knowledge to carry out the curriculum successfully. It consists of data analysis, instructional design, evaluation design, and curriculum design. Teachers must thoroughly understand the curriculum they use, provide quality tests and teaching materials, and be capable of using the evaluation results to modify their teaching methods. To ensure that children receive an excellent education that will prepare them for future success, it is essential to develop the competence of teachers in implementing the Kurikulum Merdeka.

According to Al-Fathoni (2020), implementing change management activities has proven to be a very effective strategy for increasing teacher capacity in mastering the Kurikulum Merdeka. The excellent outcomes of the action research and the positive feedback from teachers highlight the need to use organized change management interventions to facilitate educators' ongoing professional growth and development. This research's expertise is helpful to the academic community, emphasizing the necessity of strategic change management techniques in promoting excellence in teaching and learning practices. In implementing Kurikulum Merdeka, teachers must develop at least four items of ability in the teacher's pedagogical competence related to mastery of curriculum management, student management, academic activity management, and administrative management (Sutrisno & Yulia, 2022).

Mashrabjonovich (2023), a specialist in the twenty-first century, is a highly professional person who can think creatively, make non-standard decisions, and accept responsibility for these decisions. Only by solving professional problems competently and effectively using information technology can a teacher's efforts in the sphere of education be more successful and with lower psychological costs. The professional competency of a teacher, based on new forms of education, heightens his demand for continuous self-development and self-improvement. Based on the preceding definition, the author concludes that schools nowadays are an information and educational environment that reflects overall education. The current educational information technology system places unique demands on the professional skills of educators.

Teachers need to update their competence to prepare for 21st-century challenges. Teaching strategies need to change, and so do the competencies teachers need to develop to empower 21st-century learners (Caena & Redecker, 2019). Teachers were confronted with the need to adapt to technology. Information

and communication technologies (ICT) tools, mainly digital teacher competence and teacher education opportunities to learn digital competence (König et al., 2020). In other research, it is written that an educator or instructor must be adept in using technology and digital communication tools to access, use, and even assess digital-based learning processes. This is regarded as the teacher's digital capability in instructing students to actively and creatively learn new information. This is very much related to the life of today's active students, Generation Z. This research aimed to look into elementary school teachers' digital literacy skills in managing teacher learning. The digital skills of a teacher can build passion and harmony between instructor and pupils in studying courses, particularly science, which is usually more challenging for children (Marnita et al., 2023).

Research conducted by Wantiana and Melissa (2023) also reveals that there are still challenges in using the Kurikulum Merdeka that has been established. The location of the school's boundary between the village and the metropolis, its fragile libraries and Internet resources, and less skilled teachers. The main challenge for teachers in implementing the Kurikulum Merdeka is the limited learning resources in textbooks and the lack of government socialization in connection with the Kurikulum Merdeka to the school, resulting in a lack of preparation for the teacher to switch to the Kurikulum Merdeka. Therefore, to ensure the successful delivery of the curriculum, teachers must have a high level of competence when implementing the Kurikulum Merdeka in schools, including information, communication, and technology skills. Students should achieve a set of learning plans. The curriculum must be redesigned to implement competency-based education, including teacher evaluation and assistance. The role of teachers in shaping the quality of the learning experience is crucial in modern education.

This research examines the competencies teachers need to have, especially those that support the implementation of Kurikulum Merdeka. This research will explore ways to develop teacher competence, such as professional development, mentoring, and collaboration. It can provide insights that can help schools implement the Kurikulum Merdeka effectively and ensure students receive quality education by examining the limitations faced by teachers, the skills and knowledge that teachers should have, and strategies that can be used to develop teacher competence. Implications of this research are expected that teachers with adequate digital competencies can help improve the quality of human resources in Indonesia, thus helping to achieve national development goals.

## LITERATURE REVIEW

### Curriculum

Beauchamp, in a book titled "*Curriculum Theory*" argues in his book that a curriculum is a written document containing themes to be taught to students through various subjects, scientific fields, and formulating problems in everyday life. The curriculum expresses the goals and expectations of educators/teachers through educational plans and programs implemented in schools. The curriculum is the goal and strategy, while the teaching and learning process is how it is done. Teachers and students are involved in this process. The objectives, content, teaching resources, and methods utilized in implementing educational activities are determined by the curriculum, which is a set of plans and instructions. It is not a single concept but has many different forms and interpretations. The written plan is implemented through the curriculum (Hamdi, 2020).

### Curriculum Management

According to Rusman, in a book titled "*Manajemen Kurikulum*" management is a general process encompassing many actions such as planning, organization, activation, and monitoring. All these actions are aimed at achieving a goal using all available resources. Curriculum management is an essential part

of an educational institution and significantly impacts the quality of education. Due to fast and unpredictable developments, professional education is challenged with responsiveness, which demands a rethinking of conventional curriculum development approaches (Vreuls et al., 2022). There are some practices in curriculum management, according to Rusman, in a book titled "*Manajemen Kurikulum*" which can be used to improve the quality of education. (1) Comprehensive planning: Implementing an educational program with a pre-defined objective requires thorough planning; (2) Curriculum administration is democratically administered, ensuring that administrators, executives, and student subjects carry out their obligations in a responsible manner that satisfies curriculum aims, (3) Periodic evaluation: evaluations should be carried out to determine how successful educational programs are running and where improvements can be made, (4) Curriculum Development: For educational programs to evolve, curriculum development must be done, (5) Improving the quality of teachers is essential to ensure that instructors can implement the curriculum correctly with the set objectives.

### Curriculum Implementation

According to Mulyasa, in a book titled "*Pengembangan dan Implementasi Pemikiran Kurikulum*" the process puts ideas, concepts, policies, or innovations into action in such a way that they have a positive impact in the form of a change of knowledge, skills, values, and attitudes, known as implementation. Curriculum implementation is the application or implementation of a curriculum developed at a previous stage, then tested by implementation and management, while continuously adapting to the actual situation. and student characteristics, such as their intellectual, emotional, and physical development. Beauchamp, in a book titled "*Curriculum Theory*" the teacher's first responsibility in implementing a curriculum is to prepare the learning environment in various ways so that the relevant curriculum can be implemented by developing learning methods.

The search results indicate that a teacher's two core competencies, substantial competence in the learning material or knowledge of the subject and competency in learning methodology, are necessary to succeed in the learning process. This means that in addition to knowing the subject matter, a teacher must also be familiar with the instructional strategy that best meets the demands of the lesson plan, which refers to pedagogical principles, including understanding the characteristics of the student. In implementing the curriculum, teachers are crucial (Prasetyono et al., 2021; Zamri & Hamzah, 2019). Teachers must possess pedagogical, personal, professional, and social competencies to increase curriculum implementation quality. To handle the complex difficulties of today's society, teachers require a wide range of competencies (Mandal, 2018; Kaendler et al., 2015).

Setting high but reasonable standards, fostering a love of learning, listening to others, being adaptable, and participating in suggested professional growth and development activities are the competencies that significantly affect student achievement (Kaendler et al., 2015). Teachers must be well-versed in various topics, teaching techniques, test-taking strategies, state standards, and student learning requirements (Zamri & Hamzah, 2019). In order to support effective curriculum implementation, programs must implement the curriculum faithfully, individualize it to meet the needs of all children and families, including those of children with disabilities, and adapt it to all children and families' cultural and linguistic needs, including those of dual or tribal language learners (Kigen, 2017).

### Kurikulum Merdeka

Kementerian Pendidikan, Kebudayaan, Riset, dan Teknologi Republik Indonesia, through their website, shows that the Kurikulum Merdeka is a curriculum with diversified intra-curriculum learning in which the content is optimized so that students have ample time to deepen concepts and strengthen competencies

(see: <https://kurikulum.kemdikbud.go.id/kurikulum-merdeka/>) Teachers can choose a variety of teaching devices so that learning can be adapted to the learning needs and interests of the student. This curriculum, characterized by Soft Skills and Character Development, Focus on Essential Subjects, and Flexible Learning, allows educators to create quality learning that matches the needs and learning environment of the student. Kurikulum Merdeka aims to improve the quality of education in Indonesia by providing a more flexible and adaptive curriculum that produces competent graduates who have good character and can compete globally. Curriculum development should be directed holistically, competency-based, contextual, and personalized (Susilana et al., 2023). Kurikulum Merdeka expected will have the same direction as an effort to restore learning after the pandemic.

### **Teacher's Digital Competence**

Teachers' competence is a combination of personal abilities and technological, social, and social knowledge holistically form the teacher's standard competence, according to Mulyasa in a book titled "*Pengembangan dan Implementasi Pemikiran Kurikulum*". Peraturan Menteri Nomor 16 Tahun 2007 tentang Standar Kualifikasi Akademik dan Kompetensi Guru wrote the teacher competence standard that should be developed integrally from four main competencies, namely pedagogical, personal, social, and professional competence (see: [https://jdih.kemdikbud.go.id/detail\\_peraturan?main=480](https://jdih.kemdikbud.go.id/detail_peraturan?main=480)). From this definition, it can be concluded that the teacher's competence includes the mastery of personal abilities, and technological, social, and spiritual knowledge that form the standard competence of the teacher. Teacher competence also includes the knowledge, skills, and behavior that must be possessed to be able to realize its performance properly and effectively.

Digital literacy of teachers, according to Gilster in Mariani (2022), is the teacher's ability to understand and use information obtained from various digital sources. Teachers who have good digital literacy will be able to develop the skills and knowledge necessary to use technology in learning. Nugraha (2022) and Hadiapurwa et al. (2022) affirms that teachers' digital literacy also includes the teacher's ability to use technology to improve the quality of learning. Implementation of the Kurikulum Merdeka requires a teacher who has good competence in managing Merdeka Belajar. Teachers who have good competencies will be able to develop the skills and knowledge necessary to use technology in learning. Digital literacy development strategies in implementing the Kurikulum Merdeka include developing training programs for teachers to integrate digital literacy into learning. It is an essential step in preparing educators to face the learning challenge of improving the quality of learning.

## **METHODS**

Generally, a library review is a discussion or reading material associated with a topic or research findings. The method used is the study of literature, emphasizing references or books used as references for researchers to identify the development of teacher competence in applying the Kurikulum Merdeka. Researchers conduct searches to find literature sources relevant to research topics, using keywords "implementation of the Kurikulum Merdeka", "teacher competence", and "digital literacy of teachers", through Google Scholar, online libraries, and online journal databases. The next step is for researchers to read the library sources found carefully and then study and analyze the selected sources. Researchers compile correlations of findings with previous research results and compile research reports systematically.

## **RESULT AND DISCUSSION**

### **21st Century Skills and Teacher Competencies**

As a result of the advancement of science and technology in both information and communication technology and worldwide competition in the twenty-first century, students are required to acquire 21st-century skills or abilities. As a result, the learning process must likewise be geared towards the acquisition of certain talents or abilities. Students must have the following abilities or skills: character, literacy, and competency. As a result, mastery of 21st-century skills is a primary issue in the Kurikulum Merdeka, launched in February 2022 by Menteri Pendidikan dan Kebudayaan Republik Indonesia Nadiem Anwar Makarim. This has ramifications for students who are expected to develop life skills and soft skills, such as critical thinking abilities, in addition to mastery of learning materials and concepts, problem-solving, creativity, communication, and collaboration. As a result, education is becoming increasingly vital in ensuring pupils have these skills. From the perspective of the teacher's role, integrating information and communication technology in the learning process will help teachers become facilitators, collaborators, mentors, coaches, directors, and partners. Research allows students to experience learning events on their own.

Students' competency demands in tackling the challenges of the twenty-first century have implications for increased teacher competence demands. Professional teachers will produce quality educational processes and outcomes to create an intelligent and competitive Indonesian human being. These individuals must believe in and fear the One God, be noble, healthy, knowledgeable, speaking, creative, independent, and be democratic and responsible citizens (Jaenudin et al., 2021). Teachers are required to develop their competencies in the curriculum implementation process, not only in terms of the substance competence of learning materials and learning methodology competencies as described above but also in terms of the qualifications that a teacher must possess as written in Undang-Undang Republik Indonesia Nomor 14 Tahun 2005 Tentang Guru dan Dosen (see: <https://www.dpr.go.id/jdih/index/id/56>), which is regulated later in the Minister of National Education Regulation. According to the law, instructors must have four competencies: pedagogic competence, personal competence, social competence, and professional competence.

A study showed that one of the challenges of implementing the Kurikulum Merdeka is training students' soft skills through various school and learning activities (Angga et al., 2022). This will, of course, have an impact on teachers who will also be required to improve their quality by being creatively innovative in methods, media, and learning techniques, and the teacher's mindset changes in implementing learning. Other research concludes that student learning achievement can be further improved through strengthening teachers' professional competence (Wahid et al., 2023).

As a teacher, professionalism means having strong knowledge and the ability to keep up with developments in science and technology (Maimun & Hakim, 2021). In another research, Hoesny and Darmayanti (2021) wrote that four teacher competencies must be considered to improve teacher quality. Improving teacher quality can be achieved through professional development. Apart from that, to answer the challenges in the era of the digital revolution, teachers also need to improve their skills in using digital technology to improve the quality and attractiveness of learning.

### **1. Pedagogic Competence**

Pedagogic competence is defined in the National Education Standards as understanding students, designing and implementing learning, measuring learning outcomes, and developing students to realize their full potential. The following are the aspects that the teacher must master:

- a. Understanding Learners' Characteristics
- b. Capable of Developing a Curriculum

- c. Capable of Mastering Learning Theory and Learning Principles
- d. Capable of Developing Learners' Potential
- e. Presenting Educational Learning Activities
- f. Establish Student Communication
- g. Capable of Conducting Assessments and Evaluations

Octavia describes several indicators of pedagogic competence in the book titled "*Profesionalisme Guru dalam Memahami Perkembangan Peserta Didik*" which are used to measure the extent to which teachers master pedagogic competence, namely:

- a. Understanding of insights and also the foundation of education.
- b. Understanding of pupils begins with the character of the students taught by the teacher.
- c. Knowledge of the educational curriculum that is applied and enforced in schools.
- d. Learning design that is suited to students' requirements.
- e. Implementing educational and dialogic learning implies moral education during instruction and a conversation process between teachers and students.
- f. Use learning technology to introduce technology to kids so they don't stutter and broaden the range of learning techniques.
- g. Learning result evaluation, such as summarising learning outcomes and shortcomings as material for improvement.
- h. Student development to realize or promote the many potentials that each individual possesses.

## 2. Personality Competence

Teacher's skills are personal abilities that demonstrate a strong, stable, mature, intelligent, and authoritative personality, be an example to students, and have a noble personality (Istiyono et al., 2021). Teachers with strong personalities will be able to manage learning effectively, including their ability to communicate with students. Based on Peraturan Menteri Nomor 16 Tahun 2007 tentang Standar Kualifikasi Akademik dan Kompetensi Guru, the following indicators for measuring teacher personality skills are provided (see: [https://jdih.kemdikbud.go.id/detail\\_peraturan?main=480](https://jdih.kemdikbud.go.id/detail_peraturan?main=480)):

- a. Obey Indonesian religious, legal, social, and cultural traditions.
- b. Present yourself as an honest, noble individual who serves as a role model for pupils and society.
- c. Present oneself as steady, stable, mature, intelligent, and authoritative.
- d. Show a strong work ethic, a sense of duty, pride in teaching, and self-assurance.
- e. Uphold the teaching profession's code of ethics.

## 3. Social Competence

Teachers' social competency is defined as their ability to communicate and engage effectively as members of the community with students, fellow educators, education staff, students' parents/guardians, and the surrounding community (Kamal et al., 2021). It was also mentioned that social competency is the ability of teachers as members of society to:

- a. Understanding and respecting differences, as well as the ability to manage stress and disputes.
- b. Work harmoniously with colleagues, school principals, vice principals, and other associated parties.
- c. Create a small, intelligent, dynamic, and agile staff.
- b. Maintain effective and enjoyable communication with all school members and parents, fully aware that everyone has a role and obligation in promoting learning.
- c. Understand and internalize environmental changes that affect their responsibilities.
- a. Being able to situate himself inside the surrounding community's value system.
- b. Put in place excellent governance concepts (such as participation, openness, accountability, law enforcement, and professionalism).

#### **4. Professional Competence**

Professional competence, according to [Rahman \(2014\)](#) in the journal he wrote, refers to a thorough and in-depth knowledge of the learning material, including the mastery of the teaching material in schools and the mastering of the structures and techniques of science. The essential markers of professional sub-competencies are as follows:

- a. Mastery of scientific content is associated with indicators in learning areas such as understanding of curriculum materials and the structure, concepts, and methods of science with relevant materials. Teaching materials, understanding the conceptual relationships between related subjects, and applying scientific concepts to everyday life.
- b. There are marks of competence in mastering scientific structures and techniques, such as mastering the critical research and research steps to professionally advance knowledge/subject in a professional environment global school.

According to Suprihatiningrum in the book titled “*Guru Profesional: Pedoman Kinerja, Kualifikasi, dan Kompetensi Guru*” the following are indicators of professional teacher ability in subject matter mastery:

- a. Master the sciences as a learning resource;
- b. Master the subject taught;
- c. Mastering knowledge of student characteristics;
- d. Mastering knowledge of philosophy and educational goals;
- e. Mastering knowledge and mastering teaching methods and models;
- f. Master the principles of learning technology;
- g. Master the assessment knowledge and the ability to plan and lead for a smooth educational process.

#### **Teacher Professional Competency Improvement**

The teacher of the twenty-first century must deal with difficulties and situations that his predecessors could not even envisage. New technology tools imply new and distinct methods of accessing and processing information required for teaching and learning. Teachers and students must have the skills and knowledge to confront these new difficulties and apply new techniques. Teachers must be proficient in using technology in education and grasp how new learning modes, learning resources, learning media, and other factors are related. In developing four teacher competencies, digital literacy needs special attention ([Jannah et al., 2020](#)).

Educators must develop teacher competence in the Kurikulum Merdeka to support the implementation of the Kurikulum Merdeka. They might do this by expanding their professional ability as instructors. According to the International Society for Technology in Education, there are various aspects of 21st-century teaching skills, the most prominent of which is the information age.

The following are the five categories of 21st-century teacher skills:

1. Facilitating and inspiring student learning and creativity;
2. Creating digital era learning experiences and evaluations; and
3. Serving as an example for learning and working in the digital age.
4. Encourage and model accountability in a digital society and
5. Take part in professional development and leadership.

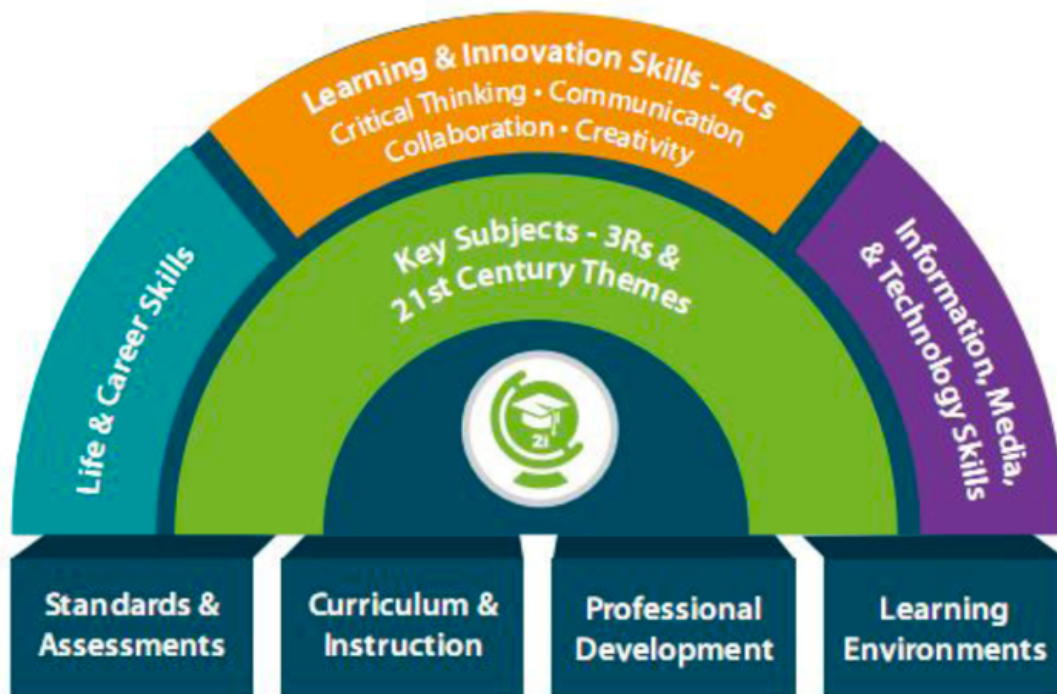
Professional teachers must be able to convert cultural values into knowledge to achieve improved quality and competitiveness. The professional qualifications of teacher education are summarised as follows:

1. Personal capability (person capability) implies that teachers must have adequate knowledge, abilities, and attitudes to effectively supervise the learning process.



2. The teacher is an innovator, which means that the teacher must be open to new ideas and knowledge. Teachers are required to possess the necessary knowledge, abilities, and attitudes toward innovation and be effective disseminators of new ideas.
3. The teacher is a developer (developer), which means he must have a good, comprehensive, and consistent teacher vision. To meet the difficulties of the times, teachers must be willing and able to look far ahead, especially in the education sector, which is described as a system.

Furthermore, the 21st-century knowledge-skills rainbow scheme summarises the 21st-century talents. The concept was adopted by the non-profit organization p21, establishing a global 21st-century education framework through **Figure 1** below: (see: [www.p21.org](http://www.p21.org))



**Figure 1.** 21st Century Knowledge Skills  
Source: [www.p21.org](http://www.p21.org)

According to **Figure 1**, the Partnership for 21st Century Skills [3] is a collaborative organization of governments and businesses that defined a framework for developing the skills, aptitudes, and attitudes to succeed in the workplace and 21st-century society. It lists three types of competencies: (1) learning skills (creativity and innovation, critical thinking, and problem-solving; communication and collaboration); (2) literacy skills (information literacy, media literacy, ICT literacy), and (3) life skills (flexibility and adaptability; initiative and self-direction; social and intercultural skills; productivity and accountability; leadership and responsibility). Cultivating students' information literacy is becoming increasingly important for teachers in the 21st century (Wu et al., 2022).

Being born and raised in a different age than kids necessitates teachers continuing to learn to keep up with the times, particularly in the realm of technology, to deliver the best possible education to pupils. In today's digital environment, becoming a great teacher requires skillfully and wisely grasping and using technology. The rapid growth of technology allows for several sources of knowledge that are relatively unstoppable. Teachers who still utilize traditional approaches cannot match the ability to give knowledge content during the learning process. At this moment, teachers with digital competency are an absolute necessity. According to González-Pérez and Ramírez-Montoya (2022), educational models and formal

and informal educational practices scale the development of 21st-century competencies to a complex, changing world. It is essential to clearly understand the objectives and indicators of employment competencies to assess competency models worldwide, updating them periodically using research data from educational institutions. Educational models must integrate artificial intelligence, data management, ubiquitous technologies, robots, and cloud computing to facilitate.

## Discussion

Implementation of the Kurikulum Merdeka is closely related to the demands of teacher competency to improve students' 21st century skills, including: (1) The Kurikulum Merdeka encourages the development of 21st century skills such as critical, creative, collaborative, and communicative thinking; (2) The Kurikulum Merdeka gives students the freedom to explore their potential and interests more broadly to improve students' 21st-century skills. Teachers are essential in developing student competencies, including 21st-century skills (Maulidia et al., 2023).

Because teachers play the most significant roles in the implementation of education in the current industrial revolution, digital literacy is one of the most crucial competencies used to train professional instructors (Rahmi & Safrida, 2023). Therefore, developing teacher competencies is also essential in implementing the Kurikulum Merdeka. In developing teacher competencies, good skills and knowledge are required in managing independent learning, digital literacy, and collaboration between teachers, schools, and stakeholders. From these points, it can be concluded that implementing the Kurikulum Merdeka can help enhance the skills of students of the 21st century through project learning and give students the freedom to dig their potential and interests more broadly. Teachers have an essential role in developing student competencies, including 21st-century skills, so developing teacher competencies is also an essential goal in implementing the Kurikulum Merdeka, particularly the development of digital competencies.

Digital competence encompasses more than just digital abilities. Digital competence encompasses technical factors linked to hardware and software administration and cognitive qualities related to knowledge and education (Erstad et al., 2021). In education, digital competence can be defined as using technology to attain learning and educational goals persuasively, appropriately, and safely. Problem-solving using digital tools entails having the knowledge and skills to select digital tools, create and use digital tools, or solve technical challenges by utilizing technology to solve problems and apply them creatively. Capable of making informed selections concerning digital tools based on their intended use and requirements (Siripan & Noirid, 2022).

According to Shavkatovna (2020), there are at least five digital skills that teachers in the 21st-century should strive for, which are:

1. Data and information literacy. Competence in data and information search, selection, sorting, evaluation, and management.
2. Collaboration and communication. Competence encompasses communicating, sharing, participating, and collaborating with digital technologies. Understanding and abilities in managing digital identity and respecting digital world ethics must also be attained.
3. The ability to create digital content includes numerous talents in building, integrating, and re-creating digital content. This competency also requires knowledge of copyright, licensing, and programming.
4. Security includes the capacity to ensure device protection, data and confidentiality, health, and the learning process.
5. The technical capacity to solve and overcome difficulties, identify demands and appropriate technological replies, innovate using digital technology, and detect deficiencies in digital technology.

According to [Blyznyuk \(2019\)](#), the following digital competencies are required of teachers:

1. Information, in the ability to search, choose, and sort information, information/data literacy, information management, and information evaluation for existing learning.
2. Communicating with or with students and other educators to collaborate, communicate, and share digital technologies.
3. Edition Content Creator, digital learning content can pique students' interest in learning more in-depth subjects, such as animation, infographics, or the like.
4. Data security and protection as a product of digital technology in learning.
5. Educational Problem-solving is a technological problem that is solved by detecting flaws in digital technology in learning and being creative in how to use it constructively.

To improve digital competence, teachers must take an active role. These digital competencies can be developed in various ways, including:

1. Participate in training or training; Training or coaching can be done offline or online. Teachers can improve their competence and skills in managing the learning process through training or education.
2. Seminars: Seminars can also help teachers improve their knowledge or skills. Teachers can learn about education and teaching by attending seminars.
3. Activate the MGMP (Subject Teacher Deliberation) and KKG (Teacher Working Group) teams; Teachers must hold talks or exchange various knowledge and experiences with other teachers to develop knowledge through the MGMP and KKG teams.
4. Action research is carried out to test, develop, discover, and create new actions. If these actions are carried out, the process will be easier and faster, and the results obtained will be more significant and of higher quality.
5. Continuing education at a higher level. Teachers can better understand the nature, duties, roles, functions, and responsibilities of teachers in education by continuing their studies. Continuing education also improves your abilities, qualities, and capabilities in teacher education and training.

In addition to having digital competence, teachers need to take a learning approach that matches the needs of the students. Digital Pedagogy is an approach that is not just about teachers' ability to use technology. However, teachers must be able to utilize technology to build students' critical thinking skills and develop students' good attitudes toward technology ([Rahayuningsih & Muhtar, 2022](#)).

## CONCLUSION

Based on the analysis of the literary sources presented, it can be concluded that in implementing the Kurikulum Merdeka, teachers must meet the standards of good pedagogical, personal, social, and professional competence and good digital literacy ability to use technology in learning. However, it also found obstacles teachers face related to implementing the Kurikulum Merdeka that originate from the internal teachers themselves, such as the weak competence teachers have and the lack of support and facilities from schools and the government.

Implications of this research are the development of teacher competencies that can be done through training, self-development, the use of technology, enhancing collaboration and cooperation, developing methodological skills, and seeking guidance and consultation from relevant parties. This development of teacher competence will benefit schools, teachers, and students in improving the quality of learning. Solutions offered by literature sources include (1) improving teacher competence through training and self-development, (2) enhancing teacher digital literacy to leverage technology in learning, and (3) enhancing collaboration and cooperation between teachers, schools, and stakeholders.

## AUTHOR'S NOTE

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