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Implementation of the Kurikulum Merdeka in Informatics lessons at SMPN 4 Ciawigebang

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ABSTRACT

This study aims to describe the implementation of the Merdeka Curriculum in Informatics at SMPN 4 Ciawigebang, focusing on the challenges faced, opportunities available, and strategies applied to support more adaptive learning that is relevant to students' needs in the digital era. A case study approach with a qualitative descriptive method was used, involving data collection through in-depth interviews with the school principal and Informatics teachers, direct classroom observations, and relevant document analysis. The main findings of this study show that, despite limitations in facilities, including a limited number of computers and inadequate laboratory conditions, SMPN 4 Ciawigebang successfully overcame these challenges through adaptive strategies, such as the use of students' personal devices and differentiated learning. Student-centered and project-based learning proved effective in enhancing student engagement and creativity. This research contributes significantly to understanding the implementation of the Merdeka Curriculum at the junior high school level, particularly in Informatics, which emphasizes the development of digital skills. The practical implications of these findings underscore the need for adequate infrastructure and ongoing teacher training to support the implementation of the curriculum. Further research is recommended to explore the long-term impact of this curriculum implementation and the role of technology in learning in schools with limited facilities.

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ABSTRAK

Penelitian ini bertujuan untuk menggambarkan implementasi Kurikulum Merdeka dalam mata pelajaran Informatika di SMPN 4 Ciawigebang, dengan fokus pada tantangan yang dihadapi, peluang yang ada, serta strategi yang diterapkan untuk mendukung pembelajaran yang lebih adaptif dan relevan dengan kebutuhan murid di era digital. Pendekatan yang digunakan adalah studi kasus dengan metode deskriptif kualitatif, yang melibatkan pengumpulan data melalui wawancara mendalam dengan kepala sekolah dan guru Informatika, observasi langsung terhadap kegiatan pembelajaran, serta studi dokumentasi yang relevan. Temuan utama penelitian ini menunjukkan bahwa meskipun terdapat keterbatasan sarana dan prasarana, seperti jumlah komputer yang terbatas dan kondisi laboratorium yang kurang memadai, SMPN 4 Ciawigebang berhasil mengatasi hambatan-hambatan ini dengan strategi adaptif, seperti pemanfaatan perangkat pribadi murid dan pembelajaran diferensiasi. Pembelajaran yang berpusat pada murid dan berbasis proyek terbukti efektif dalam meningkatkan keterlibatan dan kreativitas murid. Penelitian ini memberikan kontribusi penting terhadap pemahaman implementasi Kurikulum Merdeka di tingkat SMP, khususnya dalam bidang Informatika, yang berfokus pada pengembangan keterampilan digital. Implikasi praktis dari temuan ini adalah perlunya penyediaan infrastruktur yang memadai dan pelatihan berkelanjutan bagi guru untuk mendukung penerapan kurikulum ini. Penelitian lebih lanjut disarankan untuk mengeksplorasi dampak jangka panjang implementasi kurikulum serta peran teknologi dalam pembelajaran di sekolah dengan fasilitas terbatas.

Kata Kunci: *Kurikulum Merdeka; pembelajaran berdiferensiasi; strategi adaptif; teknologi dalam pendidikan*

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INTRODUCTION

The era of globalization is marked by the rapid development of information and communication technology, and the education sector is required to transform significantly. Changes in the use of technology in education not only affect technical aspects but also shape perspectives on the learning process and educational outcomes (Engelbrecht & Borba, 2024; Rosyiddin *et al*., 2023; Timotheou *et al*., 2023). The increasingly dynamic world of work requires graduates who not only master theoretical knowledge but also think critically, creatively, collaboratively, and adaptively to changing times (Lukita *et al*., 2023). Therefore, the national education system must provide ample space for students to develop their potential optimally in line with the development of science and technology.

In response to these challenges, the Indonesian government, through the Ministry of Education, Culture, Research, and Technology, launched the Kurikulum Merdeka as part of an education system reform. This curriculum emphasizes the flexibility of student-centered learning, character strengthening through the Pancasila Student Profile, and the development of competencies that are contextual and relevant to future needs (Ratnawati *et al*., 2024; Simarmata & Mayuni, 2023). One of the main principles of the Kurikulum Merdeka is to give educational units flexibility to compile and manage the curriculum according to their respective characteristics and needs, while still referring to the national learning outcomes that have been determined (Septiani *et al*., 2024).

SMPN 4 Ciawigebang is one of the driving schools appointed as the initial implementer of the Kurikulum Merdeka. As part of the educational transformation program, this school has a big responsibility in implementing the new curriculum as a whole, including in the subject of Informatics. Informatics subjects are crucial for equipping students with digital literacy, basic programming skills, and an understanding of the technologies they will encounter in the future (Fitrihana & Nurdiyanto, 2024; Thelma *et al*., 2024). Thus, the implementation of the Kurikulum Merdeka in Informatics subjects at SMPN 4 Ciawigebang is a strategic step in creating an educational ecosystem that is relevant to the needs of the digital era.

Previous research has identified that the successful implementation of the Kurikulum Merdeka is highly dependent on three main factors, namely improving teacher competence, the availability and quality of teaching tools, and adequate infrastructure support (Vinaya *et al*., 2025). These findings align with research showing the importance of the readiness of human and material resources in supporting the transformation of the educational curriculum. Meanwhile, other research reveals various challenges encountered in implementing the Kurikulum Merdeka, including limited technological infrastructure, gaps in teachers' capacity to master new materials, and the need for continuous training and mentoring (Al Munawar *et al*., 2025). This study provides a clear picture of the practical obstacles encountered in the field during implementation. Furthermore, other research emphasizes the importance of precisely mapping the curriculum implementation process in the field to evaluate the extent to which programs are performing as expected and to identify effective strategies to address emerging barriers (Khaira *et al*., 2023).

Unlike previous research that focused more on general challenges or the implementation of the Kurikulum Merdeka at the high school level or in other subjects, this study specifically examines the implementation of the Kurikulum Merdeka in Informatics subjects at the junior high school level. This area is still rarely studied in depth. A case-study-based approach in early implementing schools, such as SMPN 4 Ciawigebang, provides a contextual perspective that has not been widely reported in the previous literature.

This research aims to comprehensively trace and describe the process of implementing the Kurikulum Merdeka in Informatics subjects at SMPN 4 Ciawigebang. The focus of the study includes the background of the selection of schools as implementers of the Kurikulum Merdeka, the process of developing teaching and learning tools, technical and non-technical challenges faced during implementation, as well as the

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strategic approach taken by schools and Informatics teachers in ensuring that the implementation of the curriculum runs in accordance with its essence. Thus, this article is expected to make a scientific contribution through empirical reflection on the practice of implementing the Kurikulum Merdeka at the school level, especially in the context of technology and informatics education.

LITERATURE REVIEW

Kurikulum Merdeka Learning

The Kurikulum Merdeka is an educational innovation that aims to liberate students in the learning process. This curriculum addresses individual student needs through a differentiated learning approach and strengthens the profile of Pancasila students. By providing educational units with leeway to design the learning process according to students' potential and needs, the Merdeka Curriculum accommodates the development of science and the changing social dynamics of society. Regular curriculum updates, including the transition from the 2013 Curriculum to the Kurikulum Merdeka, are a strategic step to respond to the challenges of an increasingly complex era (Aini, 2023; Sholeh *et al*., 2023). One of the main principles of the Kurikulum Merdeka is to create an inclusive and equitable learning environment. The implementation of this curriculum aims to translate curriculum documents into practice in teaching and learning activities, an important process in Indonesian education (Fauzan *et al*., 2023; Purnama & Pawiro, 2023). By emphasizing equal opportunities for all students, the Kurikulum Merdeka aims to ensure that every student has access to education that suits their needs, in line with the basic principles of inclusive and equitable education.

Another important principle in the Kurikulum Merdeka is child-centered learning. In this case, teachers not only transfer knowledge but also facilitate students in becoming active and independent learners. By providing space for students to think critically and independently, and to assess themselves, the Kurikulum Merdeka encourages students to take an active role in their learning process. This creates a more interactive learning space that focuses on developing deep thinking skills (Djoeaeriah & Iskandar, 2024; Irwan & Aslan, 2024). The differentiation approach applied in the Kurikulum Merdeka is one of its distinctive features. Learning is designed to suit the unique characteristics and potentials of each student (Fauzan *et al*., 2023). Teachers are expected to be able to identify the needs and potential of individual students, so that the material provided can be adjusted to their level of understanding and ability.

The Concept and Role of Driving Schools

The Driving School is a strategic program launched by the Ministry of Education and Culture to accelerate the progress of public and private schools, both in urban and rural areas. The program is designed to take schools moving one to two stages further, with a focus on developing student learning outcomes. This includes improving competencies, such as literacy and numeracy, as well as strengthening students' character. This program began with improving the quality of human resources, namely school principals and teachers, who are the main pillars in the successful implementation of the Kurikulum Merdeka (Manalu, 2022). The strategic function of the Driving School is to serve as an initial implementer and a pilot in the implementation of the Kurikulum Merdeka. Driving schools play a pioneering role in testing and adapting this curriculum before it is widely implemented at the national level (Hariyati *et al*., 2023; Mulyadi & Mardiana, 2022; Susilana *et al*., 2023). Thus, driving schools not only serve as curriculum implementers but also as models for other schools to emulate in implementing a curriculum that is more flexible and relevant to future needs.

During its implementation, the Curriculum Development Team (TPK), comprising various stakeholders in the school, including the learning committee, has an important responsibility to adjust and develop the

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curriculum in accordance with the local conditions and context of each school (Mulyadi & Mardiana, 2022). This adjustment is important to ensure the implemented curriculum is more relevant and aligned with the needs and characteristics of students at the school. The Driving School also functions as a living laboratory to test the effectiveness of the Kurikulum Merdeka. Through this trial process, driving schools can provide *helpful feedback* to improve education policies before they are implemented nationally (Hariyati *et al*., 2023). By serving as a forum to test various education policies, driving schools can provide valuable learning that can be applied to improve the quality of education across Indonesia.

The Utilization of Technology and Information in the Implementation of the Kurikulum Merdeka

Information about the Kurikulum Merdeka policy is usually obtained from various relevant sources, such as driving school facilitators, education offices, and online platforms managed by the Ministry of Education and Culture. These sources of information enable effective policy distribution to all levels of education in Indonesia. The use of information technology is key to facilitating communication between central and regional governments and disseminating important information related to curriculum implementation (Espinosa & Pino, 2025; Prayitno, 2023). The Ministry of Education and Culture utilizes various digital platforms to facilitate the implementation of the Kurikulum Merdeka, including the Independent Teaching Platform (PMM), Education Report Cards, ARKAS, and SIPLah. These platforms serve as a direct link between the government and education units, ensuring that the policies implemented are always up to date and aligned with the field's needs. Through this platform, teachers and principals can access the resources needed to implement education policies better.

One platform that plays a vital role in supporting the implementation of the Kurikulum Merdeka is PMM, which provides training content, learning communities, and relevant teaching materials. By using PMM, teachers can be more independent in understanding and implementing the Kurikulum Merdeka in a context that suits each school's needs. In addition, PMM helps strengthen teachers' ability to adapt this curriculum, creating a more flexible, contextually relevant learning process for students (Hulu *et al*., 2025; Hunaepi & Suharta, 2024; Nugraha, 2022). The distribution of policy information is also strengthened through platform-based data integration, which enables direct evaluation of school performance. By using the collected data, education policies can be tailored to existing needs in the field, making them more responsive and grounded in empirical evidence.

METHODS

This study uses a qualitative descriptive approach with a case study method to understand in depth the implementation of the Kurikulum Merdeka in Informatics learning at SMPN 4 Ciawigebang. The data collection technique involves in-depth interviews with principals and teachers of Informatics subjects, who were selected because they have a direct role in implementing the Kurikulum Merdeka in schools. In addition, direct classroom observation is conducted to understand naturally occurring learning practices that align with the principles of the Kurikulum Merdeka. Documentation studies are also carried out by collecting relevant documents, such as learning implementation plans (RPP), school curriculum documents, and internal policies related to the Kurikulum Merdeka.

RESULTS AND DISCUSSION

Results

The findings of this study show that implementing the Kurikulum Merdeka in Informatics subjects at SMPN 4 Ciawigebang presents both significant challenges and opportunities. The data collection process,

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comprising in-depth interviews (as shown in Figure 1), observation of learning activities, and document review, provides a clear picture of the dynamics of this curriculum's implementation in the field. The analysis focused on four main topics that are at the core of this study. First, the background for selecting the Kurikulum Merdeka for Informatics is the need to adapt learning to the rapid development of digital technology. The school recognizes the importance of strengthening students' digital literacy and basic technology skills in the digital era. Second, the mechanism for developing and implementing the curriculum at SMPN 4 Ciawigebang involves collaboration among TPK, teachers, and the school to design relevant, contextually appropriate learning.

Figure 1. Interview Documentation with Resource Persons
Source: Author Documentation 2025

Challenges that arose during implementation included limited facilities and infrastructure, particularly the shortage of computers and inadequate laboratory conditions. However, strategic measures such as gradually procuring devices and allowing students to use their personal devices have helped overcome these obstacles. Third, efforts to align learning with the basic principles of the Kurikulum Merdeka are carried out through student-centered learning. Teachers apply differentiated learning, adjusting the material and challenges according to the abilities and needs of each student. This flexible learning not only increases student engagement but also encourages them to think critically and creatively in addressing a wide range of technology-related issues. Overall, the results of this study provide a comprehensive overview of how the Kurikulum Merdeka is implemented in the context of Informatics learning at SMPN 4 Ciawigebang, and how existing challenges can be overcome through adaptive and innovative strategies.

Implementation of the Kurikulum Merdeka for Informatics Lessons

The results of the interviews show that SMPN 4 Ciawigebang chose to implement the Kurikulum Merdeka because of the government's policy encouragement and its relevance to current challenges. The Principal said,

> "*Kami mengikuti arahan pemerintah, menyesuaikan dengan perkembangan zaman dan kompetensi guru. Sebagai sekolah penggerak, kami memang harus menjadi contoh bagi sekolah lain*."

The Informatics teacher also revealed that the Kurikulum Merdeka is in line with today's needs,

> "*Anak-anak sekarang memang harus bisa menguasai Informatika, apalagi dunia sudah serba digital. Kurikulum Merdeka itu sangat mendukung pengembangan potensi murid, khususnya dalam teknologi*."

The needs of today's world children must indeed be able to master Informatics in the sense that what they must achieve will definitely need digitalization, especially in the Kurikulum Merdeka, which plans that the

https://doi.org/10.64014/hipkin-jer.v2i3.231

importance of talent development in children, especially in the field of technology, SMP 4 Ciawigebang strongly supports that the Kurikulum Merdeka can be implemented. The hope is that students can master technology, which is now developing and will continue to develop. This finding aligns with previous research confirming that Informatics lessons are a strategic means of developing students' digital literacy from an early age (Hadiapurwa *et al*., 2023; Machin-Mastromatteo, 2021). Other research also indicates that curriculum flexibility should be adjusted to local needs and teacher capacity (Bongco & De Guzman, 2022; Kabanda, 2021).

Learning according to the principles of the Kurikulum Merdeka

The principal explained that supervision is carried out periodically,

> "*Kami lakukan pra observasi, observasi, dan pasca observasi. Guru diajak refleksi agar pembelajaran sesuai tujuan dan kebutuhan murid*."

The principal conducts periodic supervision every semester. In the supervision, they conducted interviews to find out what the teacher would teach and the teaching tools that would be used, then observation to monitor how the teacher implemented the learning plan, how the teacher met the needs of the students in the classroom to achieve the learning goals, and post-observation where the principal invited the teacher to reflect on the learning that had been done. While we were still implementing the driving school program, we also routinely held a Project Management Office (PMO) every month to identify the obstacles teachers faced in implementing the Kurikulum Merdeka and jointly find solutions.

Informatics teachers emphasized the importance of differentiated learning,

> "*Murid yang cepat saya kasih tantangan tambahan. Yang butuh waktu lebih, saya bimbing pelan-pelan*,"

The speakers also created a fun learning atmosphere,

> "*Kadang kami belajar sambil dengerin lagu yang mereka suka. Anak-anak jadi lebih nyaman dan terbuka*,"

The efforts to ensure that the Informatics learning process aligns with the principles of the Kurikulum Merdeka are evident in a humanistic, adaptive, and fun approach. Teachers actively implement differentiated learning by adjusting the level of students' ability when working on problems or practice. Some students are fast, some are slow, and all are guided according to their respective needs. For students with greater abilities, teachers provide additional challenges to help their potential develop optimally. This shows attention to the individual needs of students as the core of the Kurikulum Merdeka.

The teacher creates a relaxed and non-stressful learning atmosphere. The resource person incorporated elements that students liked, such as allowing them to listen to music during study, giving them the option to choose songs, and creating a comfortable classroom with facilities like air conditioning. This approach makes students more relaxed, feel valued, and more actively involved in learning. Teachers also provide space for students to express their opinions and learning needs, encouraging them to become active subjects in the learning process. Furthermore, the teacher stated that Informatics learning should have been designed with the Kurikulum Merdeka approach from the beginning, because digital skills, such as basic programming (e.g., C or C++), are important to introduce from junior high school. This reflects teachers' critical awareness of the urgency of a relevant and progressive curriculum in the digital era. Overall, the learning approach carried out by teachers reflects the main principles of the Kurikulum Merdeka: differentiated, fun, student-centered learning, and strengthening the Pancasila Student Profile through independence, cooperation, and the spirit of working according to interests and talents. This effort

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shows a real commitment from the school, especially teachers, in reviving the spirit of the Kurikulum Merdeka in the classroom.

The Process of Development and Implementation of the Kurikulum Merdeka

The principal explained that there is a TPK and a learning committee responsible for implementing and adjusting the curriculum.

> "*TPK dan komite pembelajaran kami aktif sejak masa sekolah penggerak, mengawal semua mata pelajaran, tidak hanya Informatika*."

There is a TPK specifically responsible for implementing the curriculum in schools. In the past, when the driving school was still in effect, there was also a learning committee responsible for implementing the Kurikulum Merdeka and developing it in schools. The two teams are responsible for implementing the Kurikulum Merdeka as a whole in schools, not just in Informatics subjects.

The Informatics teacher said that before the Kurikulum Merdeka was enforced, Informatics lessons were canceled at SMPN 4 Ciawigebang. He said,

> "*Dulu Informatika sempat dihapus, jadi waktu mulai Kurikulum Merdeka kami harus bangun dari awal*."

This subject was previously replaced by Prakarya or local content (mulok), so that when the Kurikulum Merdeka is implemented, Informatics learning must start again from the basics. As a teacher under the Vice Principal for Curriculum's coordination, the resource person sees this condition as both a challenge and an opportunity to redesign learning to be more relevant.

The resource person added that the material in the Kurikulum Merdeka, especially for Informatics, is now more contextual and applicable. For example, students are introduced to basic programming using *the Scratch platform* and are given the freedom to create cross-subject projects. This approach aims to ensure that students not only understand theory but also master applicable skills, including the concepts of computer networks, the use of information technology, and the social impact of digitalization. Scratch was chosen because it can spark students' creativity in creating simple animations or *games*. Speakers even encourage cross-subject integration, such as the creation of Mathematics-based projects that are turned into interactive applications. The results show that students have potential and creativity that develop in line with their ability.

The speakers introduced the concept of a simple computer network suitable for junior high school students, including how to connect devices from cellphones to laptops and computers, and how to manage Wi-Fi connections. The resource person also introduced students to computers and operating systems, primarily as a foundation for more complex learning at the next level of education, such as in vocational schools. In terms of data processing and presentation, students are taught using various applications such as Microsoft Excel, PowerPoint, and Canva. Interestingly, the resource person found that students were more enthusiastic when invited to study in the computer laboratory compared to learning theory in class. While in the lab, students demonstrate independence, focus, and the ability to operate their own computer devices. The learning strategies that the resource persons applied emphasized a hands-on, project-based approach to practice. Resource persons often give students individual challenges and free them to solve them using their own creativity. This encourages them to be more independent and responsible for their own learning process.

One of the proudest results was when grade IX students created simple mathematical formulas as programs in Scratch, demonstrating not only an understanding of Informatics concepts but also the ability

https://doi.org/10.64014/hipkin-jer.v2i3.231

to integrate them with other subjects creatively and functionally. Overall, this Informatics teacher sees that the implementation of the Kurikulum Merdeka at SMPN 4 Ciawigebang, especially in the subject of Informatics, has a positive impact, encouraging students to be more active, creative, and adaptable to technological developments. A practical and flexible approach to learning has been proven to make students more engaged, more confident, and better prepared for future technological challenges. This is consistent with previous findings that the Kurikulum Merdeka encourages project-based learning and practical skills (Ni'mah *et al*., 2024). Flexible, context-based learning approaches in other studies have also been shown to be effective in increasing student engagement (Zhao *et al*., 2021).

Access to Kurikulum Merdeka Policy Information

According to the principal, policy information was initially routinely obtained from the driving school facilitator, but after the program was removed, access became limited.

> "S*ekarang kami hanya bisa dapat info dari dinas atau internet. ketika program tersebut masih berlaku, kami selalu mendapatkan informasi yang terbaru terkait kebijakan kurikulum merdeka. Dalam implementasi dan pengembangannya di sekolah, kami difasilitasi dan dipantau oleh Fasilitator mulai dari perencanaan, pelaksanaan, evaluasi dan tindak lanjut secara berkala. Namun, sejak program sekolah penggerak dihapus, kami hanya bisa memperoleh informasi tentang kebijakan kurikulum merdeka dari dinas pendidikan atau informasi di internet,"* he said.

The Informatics teacher added,

> "*Kami biasa berdiskusi lewat forum atau TPK, lalu sesuaikan dengan kondisi murid di kelas*,"

The resource person also admitted that he was not fixated on the textbook,

> "*Buku kadang terlalu berat untuk murid SMP. Jadi kami gabungkan dari berbagai sumber*,"

The implementation of the Kurikulum Merdeka in the subject of Informatics is carried out flexibly, adapting to students' abilities and school conditions. The resource person explained that the primary source of learning information usually comes from teachers' forums, TPK, or the education office, which is then studied and adapted before being applied in the classroom.

The resource persons began teaching in 2021, when the COVID-19 pandemic was still ongoing, so learning only ran optimally in 2022. With a background in teaching at high school and vocational schools, the resource person realized that the approach for junior high school students must start from the basics. Therefore, the resource persons do not use packaged books rigidly; instead, they choose material that is relevant and understandable to students, even if it comes from various sources. In programming instruction, for example, the speakers do not directly use languages such as C++ or PHP but instead introduce Scratch, a visual platform that students can understand. Through Scratch, students create simple projects such as number calculators or unit conversion simulations. They are given the freedom to choose topics based on their interests, which is believed to increase their enthusiasm for learning and creativity. Although students are already familiar with technologies such as AI and GPT, their understanding is still limited. This is actually an opportunity to guide them gradually. This teacher's approach reflects the spirit of the Kurikulum Merdeka, which is humanist and contextual, by emphasizing flexibility, innovation, and adaptation to students' real needs and the school environment.

Challenges and Strategies to Overcome Them

The principal said that the main challenge was the limitation of facilities,

> "*Guru kami kompeten, tapi komputer masih kurang dan lab belum terlalu nyaman. Kami lakukan pengadaan dan perbaikan secara bertahap*."

https://doi.org/10.64014/hipkin-jer.v2i3.231

In terms of human resources, there are no challenges, as SMPN 4 Ciawigebang has competent teachers who are graduates of computer science education, with the number needed. Perhaps one obstacle is the number of computers available and the convenience of the computer laboratory. The steps taken are to replace computers and repair those that are still usable gradually.

The Informatics teacher added,

> "*Beberapa komputer rusak, murid kadang harus berbagi dua orang satu perangkat. Ada juga yang pakai HP pribadi*,"

The resource person also revealed that there are psychological challenges, such as students' fear of using computers. The implementation of Informatics learning at SMPN 4 Ciawigebang still faces several obstacles, particularly in terms of facilities and infrastructure. Although the number of computers in schools is quite large, not all are operational. Some units are damaged or lack internet access. To get around this, students often share a single device in pairs, while others use their personal phones connected to the school's Wi-Fi network. Teachers also noted that some students feel unconfident using their own computers, making them more comfortable working collaboratively.

Beyond technical and psychological barriers, teachers also face behavioral challenges, such as students playing *games* or opening irrelevant sites during learning. To overcome this, teachers and their teams install *remote monitoring applications, such as Video Master,* on students' devices. This application allows teachers to monitor student activities in *real time* and provide immediate intervention if deviations are found. This approach has proven effective because it makes students more disciplined and focused in their learning. Overall, Informatics teachers demonstrate a strong commitment to maintaining the quality of learning despite limitations. Adaptive strategies such as group learning, the use of personal devices, and digital supervision systems reflect concrete efforts to optimize Informatics learning in the face of less-than-ideal conditions.

Discussion

This research provides important insights about the implementation of the Kurikulum Merdeka in the subject of Informatics at SMPN 4 Ciawigebang. The results of the study show that, despite the challenges, such as limited facilities and infrastructure, the implementation of this curriculum was successfully carried out with adaptive measures. One key finding is the importance of collaboration among TPK, teachers, and principals in designing learning experiences that meet students' needs and take into account technological developments. This research aligns with previous research indicating that the successful implementation of the new curriculum is highly dependent on the availability of adequate human resources and infrastructure (Vinaya *et al*., 2025; Al Munawar *et al*., 2025). In this case, SMPN 4 Ciawigebang addresses limitations through a gradual approach, such as procuring computer equipment and allowing students to use their personal devices, which enable learning to continue even with limited facilities.

The main challenge during implementation is the limited number of devices available to students. Some computers are broken, and some students have to share devices. This reflects the infrastructure gaps identified in previous studies (Khaira *et al*., 2023). However, the strategies implemented to address this problem, such as the use of personal phones and remote monitoring apps, offer a new perspective on how technology can be adapted to overcome limited facilities and infrastructure. These findings offer an important contribution to understanding how physical limitations can be overcome through more flexible, creative technology, which may serve as a model for other schools with similar facilities.

In addition, the differentiation approach applied by teachers in Informatics learning is also critical. Teachers provide challenges tailored to students' abilities and create a fun, non-stressful learning atmosphere. This

https://doi.org/10.64014/hipkin-jer.v2i3.231

approach aligns with the principles of the Kurikulum Merdeka, which emphasize student-centered, flexible, and creative learning (Fauzan *et al*., 2023; Irwan & Aslan, 2024). This shows that, despite the technical challenges, implementing curriculum principles that focus on students' needs can still be carried out effectively. These findings emphasize the role of teachers in creating an adaptive learning environment aligned with the curriculum's development and the demands of the times.

In addition, this study shows that Informatics teaching at SMPN 4 Ciawigebang does not focus solely on theory but also on practical skills, including basic programming with Scratch. This is a strategic step in developing students' digital skills that are relevant to future needs. Project-based approaches in Informatics learning, such as simple program development, demonstrate how students can integrate their knowledge into practical applications. This reinforces previous research showing that project-based learning can increase student engagement and creativity in learning (Ni'mah *et al*., 2024; Zhao *et al*., 2021).

From a theoretical perspective, this study provides a deeper understanding of how the Kurikulum Merdeka is applied at the junior high school level, especially in the field of Informatics. Most previous studies have focused more on curriculum implementation at the high school level or other subjects, so this study offers a new, more contextual perspective on curriculum implementation at the junior high school level (Al Munawar *et al*., 2025; Vinaya *et al*., 2025). These findings suggest that driving schools play a critical role in testing and adapting this curriculum before it is widely implemented. SMPN 4 Ciawigebang, as a driving school, serves as a living laboratory for developing a curriculum more relevant to students' needs in the digital era.

Given the challenges and opportunities, this study suggests that further research be conducted to explore in greater depth how technology can be leveraged to support curriculum implementation in schools with limited facilities. Further research is also needed to evaluate the long-term impact of implementing the Kurikulum Merdeka, especially on the development of students' digital skills at the junior high school level. In addition, this study highlights the need for greater support in infrastructure and continuous teacher training, so that the implementation of the curriculum can run optimally and provide maximum benefits for students throughout Indonesia.

CONCLUSION

This research successfully described the implementation of the Kurikulum Merdeka in Informatics subjects at SMPN 4 Ciawigebang, focusing on the challenges, opportunities, and adaptation strategies adopted by schools. Key findings suggest that while limited facilities and infrastructure pose significant challenges, differentiation-based approaches and the flexible use of technology successfully overcome these barriers. The Kurikulum Merdeka, with an emphasis on student-centered learning and the development of practical skills, has a positive impact on student engagement and creativity, in line with the existing literature.

From a theoretical perspective, this research contributes to enriching the understanding of the application of the Kurikulum Merdeka at the junior high school level, especially in the context of Informatics subjects. The research also offers a new perspective on the importance of flexibility in adapting the curriculum according to local needs and technological developments. In practical terms, these findings can serve as a reference for other schools, especially those facing similar infrastructure challenges, to implement more adaptive and innovative strategies to support digital learning.

The policy implications of this study include the need to increase support for schools in terms of technological infrastructure and continuous teacher training. Policies that are more responsive to the needs of the field, especially in providing adequate resources, will greatly support the effective implementation of the Kurikulum Merdeka throughout Indonesia. This research also opens up space for

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further research that can deepen understanding of the long-term impact of the implementation of the Kurikulum Merdeka, as well as further explore how technology can be used to support learning in schools with limited facilities.

AUTHOR'S NOTE

The author declares that there are no conflicts of interest related to the publication of this article. The author also emphasizes that all data and content of this article are free from plagiarism and have been compiled based on the results of original research. The author would like to thank SMPN 4 Ciawigebang for their cooperation and support during the observation and data collection process.

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