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Implementing Kurikulum Merdeka in Informatics learning at SMAN 7 Bandung

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ABSTRACT

This article discusses the implementation of the Informatics subject within the framework of the Merdeka Curriculum at SMAN 7 Bandung. The study is motivated by a national curriculum reform that introduces Informatics as a compulsory subject in high schools to strengthen students' digital competencies in response to rapid technological development. The aim of this research is to describe the implementation strategies of the Informatics subject and identify the challenges faced by SMAN 7 Bandung, particularly regarding limitations in human resources and infrastructure. This qualitative research was conducted through interviews with the vice principal of curriculum and the informatics teacher. This research aims to reveal that implementation has been carried out gradually, accompanied by adjustments in teaching methods and the use of technology suited to the school's conditions. The main challenges include a shortage of Informatics teachers and insufficient facilities. Nevertheless, SMAN 7 Bandung has made efforts to adapt the learning process to remain relevant and effective through active learning approaches and the use of available technologies. This study contributes to curriculum research in Indonesia, particularly in the integration of technology-based learning in Informatics education.

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ABSTRAK

Artikel ini membahas implementasi mata pelajaran Informatika dalam kerangka Kurikulum Merdeka di SMAN 7 Bandung. Penelitian ini dilatarbelakangi oleh kebijakan kurikulum nasional yang menempatkan Informatika sebagai mata pelajaran wajib di SMA untuk memperkuat kompetensi digital peserta didik dalam menghadapi perkembangan teknologi. Tujuan penelitian ini adalah untuk mendeskripsikan strategi implementasi mata pelajaran Informatika serta tantangan yang dihadapi SMAN 7 Bandung, terutama terkait keterbatasan sumber daya manusia dan infrastruktur. Penelitian dilakukan dengan pendekatan kualitatif melalui wawancara dengan wakil kepala sekolah bidang kurikulum dan guru Informatika. Hasil penelitian menunjukkan bahwa implementasi dilakukan secara bertahap, disertai penyesuaian metode dan penggunaan teknologi yang relevan dengan kondisi sekolah. Tantangan utama meliputi keterbatasan jumlah guru Informatika dan sarana prasarana yang belum memadai. Meskipun demikian, SMAN 7 Bandung tetap berupaya menyesuaikan pembelajaran agar relevan dan efektif melalui pendekatan aktif dan pemanfaatan teknologi yang tersedia. Penelitian ini memberikan kontribusi terhadap kajian kurikulum di Indonesia, khususnya dalam konteks pengajaran Informatika berbasis teknologi.

Kata Kunci: *implementasi kurikulum; Kurikulum Merdeka; pembelajaran informatika*

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INTRODUCTION

Curriculum changes in Indonesia are part of an effort to enhance the quality of education, making it more relevant to current demands. One important policy introduced by the government is the implementation of the Merdeka Curriculum, which grants educational institutions the freedom to adapt learning materials and methods according to the characteristics of students and local needs. This curriculum encompasses various aspects, one of which is strengthening digital competencies through the introduction of Informatics as a compulsory subject at the high school level, to prepare the younger generation to face rapid technological developments. The Merdeka Curriculum also offers teachers flexibility in developing learning modules, determining assessment formats, and implementing differentiated learning tailored to student needs and readiness (Gurion, 2024).

In line with these changes, SMAN 7 Bandung began implementing the Merdeka Curriculumin 2023. This school integrated Informatics into the subjects required for 10th-grade students. In the first year of implementation, Informatics teaching strictly adhered to the established curriculum structure. However, over time, schools felt the need to make adjustments to make learning more relevant to the needs and conditions of their schools. These adjustments included changes in teaching methods and the use of technology that better suited the limited resources available to schools.

A literature review of the implementation of the new curriculum in Indonesia revealed various challenges faced by schools in implementing the Merdeka Curriculum, particularly in terms of human resources (HR) and infrastructure readiness. Teacher training plays a crucial role as a key factor supporting the successful implementation of the curriculum (Zamista & Deswita, 2023). Although the implementation of a technology-based curriculum has had a positive impact, the limited availability of competent teachers and inadequate facilities often hamper its success (Asmahasanah *et al*., 2023). This suggests that while this policy has great potential, its success depends heavily on the school's readiness to face these challenges.

In this study, the authors will also discuss how Informatics teaching at SMAN 7 Bandung faces the challenge of limited resources for Informatics teaching. The success of a technology-based curriculum is greatly influenced by the educational institution's ability to provide adequate infrastructure (Hadi *et al*., 2023). Despite challenges in implementing a technology-based curriculum, schools that adapt their curriculum to local needs can still provide practical learning experiences (Lisdawati *et al*., 2024).

While numerous studies have addressed the implementation of the Merdeka Curriculum in general, studies specifically focusing on Informatics at the high school level are limited. This study aims to fill this gap by providing an empirical overview of how SMAN 7 Bandung implements Informatics within the Merdeka Curriculum framework. The primary focus of this research is the school's strategies for addressing resource limitations, particularly the number of teachers and available infrastructure. Furthermore, this study also examines efforts to adapt learning to make it more relevant and effective for students, considering the nature of Informatics as a technology-based subject that requires a different learning approach than other subjects.

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LITERATURE REVIEW

Merdeka Curriculum

The Merdeka Curriculum is an education policy designed in response to changing times and educational needs, particularly following the COVID-19 pandemic. As a form of educational transformation, this curriculum empowers educational units to design and adapt learning to local contexts and student characteristics. The Merdeka Curriculum enables more flexible learning and focuses on strengthening competencies, allowing students to develop their full potential (Pratiwi *et al*., 2023).

The Merdeka Curriculum approach emphasizes in-depth learning, prioritizing a more comprehensive understanding of concepts over mere memorization of facts (Yasmansyah & Sesmiarni, 2022). In its implementation, teachers are given the freedom to choose learning methods that suit their students' needs, making the learning process more contextual, creative, and enjoyable. This freedom is expected to increase students' motivation and encourage them to be more active in the learning process.

In addition to the explanation above, the primary objective of the Merdeka Curriculumis to develop 21st-century skills, which are essential in a constantly changing world. This curriculum focuses on character development, creativity, and collaboration among students (Pratiwi *et al*., 2023). The project-based approach implemented in this curriculum aims to hone critical thinking skills, teamwork skills, and the ability to adapt to changing times. Therefore, the Merdeka Curriculum not only prepares students with relevant knowledge but also with the skills needed for the future.

Challenges in Implementing the Merdeka Curriculum

The implementation of the Merdeka Curriculum in Indonesia presents various challenges that must be overcome to achieve the desired educational goals. One of the main challenges is teacher readiness to adapt to curriculum changes. Many teachers do not fully understand the concept and implementation of the Merdeka Curriculum, requiring intensive training and mentoring (Sucipto *et al*., 2024).

In addition to the explanation above, limited infrastructure and resources also pose significant obstacles. Many schools, especially in remote areas, lack adequate facilities to support technology-based learning, such as computers and a stable internet connection (Sucipto *et al*., 2024). This hinders the implementation of flexible, project-based learning, which is the core of the Merdeka Curriculum.

Implementing the Merdeka Curriculumin high schools (SMA) presents various challenges that must be addressed to achieve the curriculum's objectives effectively. One major challenge is the readiness of human resources, particularly teachers, to adapt to a more flexible, project-based learning approach. Many teachers are still accustomed to conventional learning methods and require training and mentoring to implement the Merdeka Curriculum optimally (Sitorus *et al*., 2023).

In addition to the aforementioned issues, limited infrastructure and supporting facilities pose a significant obstacle to the implementation of this curriculum. Although some schools have attempted to provide adequate facilities, a gap remains between the need for and the availability of facilities, particularly in certain areas (Wulandari *et al*., 2024). This impacts the effectiveness of the learning designed within the Merdeka Curriculum.

From a managerial perspective, the principal's role is crucial in facilitating this change. This is evident at SMA Negeri 1 Balongpanggang, where the principal actively guides and supports teachers and students in implementing the Merdeka Curriculum (Wulandari *et al*., 2024). However, challenges arise when the principal does not fully understand the concept and objectives of this curriculum, which can influence policies and decisions made at the school level.

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The Role of Technology in the Implementation of the Merdeka Curriculum

Technology plays a crucial role in supporting the implementation of the Merdeka Curriculum, particularly in creating flexible and student-centered learning environments. The use of educational technology enables teachers to present material interactively and adaptively, thereby increasing student engagement and motivation in the learning process (Nuridayanti *et al*., 2023). This aligns with the principles of the Merdeka Curriculum, which emphasize student-centered and contextual learning. The use of technology is a crucial part of the learning process because it can build students' awareness of the outside world, create a comfortable learning environment, and facilitate teachers' visual presentation of material (Amanulloh & Wasila, 2024).

One of the crucial roles of technology in learning is as a medium for delivering material in a visual, interactive, and engaging manner, thereby improving the effectiveness and quality of classroom learning. Technology enables teachers to develop more flexible, student-centered learning strategies and provides broader access to diverse digital learning resources. Technology is most often used as a learning medium, particularly in the form of videos, graphics, and animations, which serve as instructional aids (Nugraha *et al*., 2022). However, they also noted that technology utilization is not yet optimal in terms of teacher professional development, creating a conducive learning environment, and school administration.

The use of technology also presents challenges, particularly in terms of limited access and digital skills. Although technology can enhance learning effectiveness, many teachers and students still face challenges in accessing and utilizing technology optimally (Nuridayanti *et al*., 2023). Infrastructure limitations, such as unstable internet connections and a lack of adequate technological devices, are significant obstacles to the implementation of educational technology.

On the other hand, digital literacy is key to optimizing the role of technology in learning. Strengthening digital literacy among teachers and students is crucial to ensure that technology is used effectively and productively (Dewi & Sunarni, 2024). It is crucial for prospective teachers to ethically master the four digital literacy competencies, which include accessing, evaluating, using, and creating digital information (Isrok'atun *et al*., 2022). Furthermore, digital literacy levels are significantly related to student learning outcomes, particularly in technology-based learning (Adiawaty *et al*., 2023). With strong digital literacy, students can effectively utilize technology to access information, collaborate, and develop the 21st-century skills necessary in the workplace.

Overall, technology holds significant potential to support the implementation of the Merdeka Curriculum. However, its utilization must be balanced with increased access to infrastructure and mastery of digital skills. Strengthening technological literacy at all levels of education is also key to ensuring the effective and productive use of technology in the learning process.

The Impact of the Merdeka Curriculum on Informatics Learning

The implementation of the Merdeka Curriculum has had a significant impact on Informatics learning at various levels of education. One key change is the establishment of Informatics as a compulsory subject at the Junior High School (SMP) level. This aim aims to improve students' digital literacy and prepare them to face the challenges of the ever-evolving information technology era (Nabilah *et al*., 2022).

At the Vocational High School (SMK) level, particularly in the Software Engineering (RPL) expertise program, the Merdeka Curriculum encourages a more adaptive and contextual learning approach. As observed at SMK Negeri 1 Belimbing, West Kalimantan, the implementation of this curriculum has generated a positive response from students (Setyawan *et al*., 2024). The more active and enjoyable learning methods also increase interaction between teachers and students.

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However, the implementation of the Merdeka Curriculum in Informatics learning also faces challenges, particularly in non-formal education contexts such as Non-Formal Package Schools (SPNF). Limited resources, including access to hardware and software, pose a significant obstacle (Assulamy *et al*., 2024). Nevertheless, an adaptive and learner-centered learning approach has successfully created a learning environment that fosters the development of computing and problem-solving skills.

Overall, the Merdeka Curriculum provides an opportunity to improve the quality of Informatics learning. The approach used is more flexible and learner-centered, aligning with the needs of 21st-century learning. However, its successful implementation depends heavily on infrastructure readiness, teacher competence, and support from various stakeholders.

METHODS

This research employed a descriptive qualitative approach using semi-structured interviews. This approach was used to gather information regarding the implementation of the Merdeka Curriculum in Informatics at SMAN 7 Bandung. The goal was to gain an in-depth understanding of the policy, implementation, and challenges faced by the school. The research subjects consisted of two informants: the vice principal for curriculum and the Informatics teacher. The informants were selected purposively because both play a central role in curriculum development and implementation. This enabled the researcher to obtain relevant and comprehensive data.

Interviews were conducted in person at the school in April 2025 and were divided into three stages: preparation, implementation, and data recording. During the preparation stage, the researcher developed an open-ended interview guide tailored to each informant's role and obtained consent for participation. The implementation stage was conducted in individual, face-to-face sessions, during which interviews were recorded and transcribed with the informant's permission. The data recording stage involved transcribing the interview results for further analysis and interpretation.

The data obtained were analyzed using thematic analysis techniques, which consist of three main steps: data reduction, categorization, and conclusion. First, the researchers reread the interview transcripts to identify key points and eliminate irrelevant information. Next, the data were grouped into key themes, including implementation strategies, learning challenges, and student responses, before being compiled into a narrative that comprehensively explained the research findings.

RESULTS AND DISCUSSION

Implementation of the Merdeka Curriculum and School Adjustments

SMAN 7 Bandung began implementing the Merdeka Curriculum in 2023, in line with government policy that requires schools to adapt their curriculum. The implementation of this curriculum began with the introduction of a new subject structure, which included Informatics as a compulsory subject in grade 10. In the first year of implementation, the curriculum was followed relatively strictly, but starting in the second year, the school made adjustments to suit the needs and conditions of the school. The vice principal for curriculum explained that these adjustments were essential to ensure that learning was more relevant and practical for students, as well as to address any challenges that arose during implementation.

The adjustments made by the school included flexibility in the allocation of lesson hours, adapting learning projects to local contexts, and selecting teaching materials deemed more appropriate to student needs.

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For example, in Informatics, several topics deemed too complex or less relevant to students' circumstances were simplified or replaced with more applicable topics. This step was taken to maintain student motivation while maximizing the use of available resources.

However, the change in the curriculum structure that integrates Informatics into the elective subjects of grade 11 presents new challenges, particularly related to the limited number of teachers teaching this subject. Currently, only two teachers are teaching Informatics, so the availability of teachers limits the number of grade 11 students who can receive this subject. This results in the inability to provide Informatics instruction in grade 12, a significant limitation in meeting the needs of students who wish to explore this subject at an advanced level. Some students with a strong interest in ICT have expressed a desire to continue learning independently, although the school's support and facilities are inadequate to accommodate this.

Limited Human Resources and Infrastructure

The limited number of Informatics teachers is one of the primary obstacles to implementing the Merdeka Curriculum at SMAN 7 Bandung. For information, only two teachers are teaching Informatics, which means that learning can only be provided in grades 10 and 11. This contrasts with the curriculum's goal of a more equitable distribution of learning through grade 12. This obstacle is further exacerbated by limited school facilities, with only one computer available for three students, and several computers are broken, hampering the smooth running of practical exercises, which are essential for Informatics learning. This poses a significant challenge to providing an optimal learning experience, given the subject's reliance on technology.

In addition to the aforementioned issues, there is only one computer lab available for all students who need access to practical exercises. As a result, Informatics lessons can only be held twice a month, which is far from ideal, given the subject's nature, which requires regular practical learning. Under these circumstances, teachers are required to be creative in scheduling and arranging practical lessons to ensure continuity of learning. The limited computer equipment and limited lab schedules also impact student motivation, as students tend to be more interested in learning through hands-on practice in the lab. According to Informatics teachers, despite efforts to maximize the use of available equipment, not all students can fully benefit from technology-based learning.

This situation reflects the need for intervention from the education office to increase the number of Informatics teachers and improve the supporting infrastructure. Without increased resource allocation, the implementation of the Merdeka Curriculum will struggle to achieve its goals, especially in subjects that rely heavily on technology. Furthermore, long-term planning is necessary, including investments in digital infrastructure, teacher training, and a more efficient laboratory rotation system, to ensure equitable learning opportunities for all students. Without strong systemic support, curriculum implementation will tend to rely on individual teacher initiative, which, while commendable, is insufficient to ensure equal learning quality for all students.

Informatics Learning Strategies

In teaching Informatics, teachers at SMAN 7 Bandung adopt various learning models to make lessons more engaging and relevant to students' needs. The two most frequently used methods are project-based learning and discovery learning. Using discovery learning, students are encouraged to discover their own knowledge, for example, through tasks such as assembling a computer or figuring out how hardware or software works. This provides students with the opportunity to develop problem-solving and critical thinking skills. Project-based learning, on the other hand, encourages students to work on practical projects, such

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as creating a simple game using Scratch, which students highly seek after due to its interactive nature and immediate visualization of results.

In addition to the aforementioned topics, Informatics learning also includes an introduction to basic programming using programming languages such as Python and Pascal. Informatics teachers strive to utilize simple yet effective tools and applications, such as Canva for graphic design and office applications (Word, Excel, PowerPoint), to introduce students to various aspects of the digital world. This learning approach aims not only to enhance students' theoretical understanding but also to equip them with practical skills valuable in the real world. This aligns with the objectives of the Merdeka Curriculum, which encourages project-based learning to prepare students with 21st-century skills.

The use of active learning models also enables students to learn in groups, fosters collaboration, and encourages them to participate more actively in class discussions. The teacher acts as a facilitator, guiding the information-seeking and project completion process, rather than simply as a source of knowledge. This reflects a paradigm shift from conventional learning to more participatory, constructivist learning.

Digital Learning Support

SMAN 7 Bandung demonstrates its commitment to technology-based learning despite limited digital infrastructure. Currently, the school does not have an active Learning Management System (LMS) platform, although it previously had a similar system that is no longer in use. As an alternative, the school utilizes other applications, such as Google Classroom and Google Drive, to facilitate learning management. Through these platforms, teachers can upload course materials, assign assignments, and communicate with students about their progress in learning. However, the use of these platforms remains limited because many students struggle to access them optimally, either due to a lack of devices or a lack of technological familiarity.

Informatics teachers at SMAN 7 Bandung revealed that although the tools and technology used are not yet optimal, they strive to continue utilizing technology in the teaching and learning process. For example, although Google Classroom and Google Drive are frequently used, these applications are primarily utilized for class administration and material delivery, rather than for more in-depth interactions such as discussions or project-based collaboration. Furthermore, teachers are using simpler applications, such as Scratch and Canva, which are more easily accessible to students, although limited computer facilities pose a significant obstacle.

In this regard, schools need to continuously evaluate and strive to improve the quality of their infrastructure and access to technology to maximize digital-based learning. Furthermore, training teachers and students in the use of technology is also crucial to increasing the effectiveness of existing digital devices. Improving digital literacy in schools is a strategic step in supporting the success of the technology-based Merdeka Curriculum.

Student Responses to Informatics Learning

Most students demonstrated high enthusiasm for Informatics, especially when the learning was hands-on and involved real-life projects. In interviews, teachers reported that students were more active when asked to create digital products such as posters, short videos, or simple games. This positive response indicates that the project-based approach successfully increased student engagement in learning.

However, student responses were also significantly influenced by the availability of facilities. Students with access to computers at home tended to complete assignments more easily, while those without devices

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struggled and fell behind. This underscores the importance of equitable access to technology in supporting equitable learning.

Some students even expressed interest in continuing their Informatics learning independently through online platforms such as YouTube or learning apps. This initiative demonstrates students' intrinsic motivation to expand their knowledge beyond the classroom. However, these efforts lacked systemic support from schools due to the lack of policies or mentoring programs for independent online learning.

Teacher Readiness and Training for Implementing the Merdeka Curriculum

The implementation of the Merdeka Curriculum at SMAN 7 Bandung also requires teachers, particularly Informatics teachers, to be prepared to understand a more flexible and project-based learning approach. Interviews with teachers and the vice principal revealed that most of the formal training received by teachers is still general in nature. This training does not explicitly address Informatics learning strategies within the context of the Merdeka Curriculum.

Nevertheless, Informatics teachers at this school are independently adapting by exploring digital media, participating in online training, and networking with other Informatics teacher communities. Adaptations by teachers are necessary as an effort to update learning strategies to achieve optimal learning outcomes in Informatics (Al Munawar *et al*., 2025; Handayani *et al*., 2021). This step is taken to share best practices and identify effective learning strategies. These efforts reflect teachers' commitment to improving competency despite limited systemic support from educational institutions.

Although elementary school teachers actively participate in training programs, such as Teacher Working Groups (KKG) and online seminars, they still face challenges, including limited time, funding, and access to scientific publications (Astriani & Alfahnum, 2022). Given the context of different educational levels, these findings reflect similar CPD challenges faced by high school teachers, including in the implementation of the Merdeka Curriculum. This suggests that more structured, relevant, and sustainable training is urgently needed to support improvements in the quality of learning.

In addition to the aforementioned issues, teachers also face challenges in developing projects that are suitable for the local context and the students' abilities. This is because not all students have the same background or access to technology. Therefore, more structured and sustainable training is needed from the government or the education office.

Discussion

The implementation of the Merdeka Curriculum at SMAN 7 Bandung began in 2023, with adjustments made in the second year. This aligns with government policy that encourages schools to adapt their curricula to local needs. These adjustments are crucial because implementing a new curriculum takes time to become effective. As stated by the vice principal for curriculum, these adjustments were made to ensure the curriculum was more relevant to the school's circumstances, particularly given the limited number of teachers and facilities.

However, the limited availability of Informatics teachers, who are currently limited to grades 10 and 11, poses a significant challenge. This prevents Informatics lessons from being taught in grade 12, which reduces opportunities for students to delve deeper into the material. Limited teaching staff often hinders the implementation of a technology-based curriculum. Consequently, the implementation of the Merdeka Curriculum faces significant challenges that impact learning effectiveness (Wulandari *et al*., 2025).

One significant challenge facing SMAN 7 Bandung is limited infrastructure, particularly the number of computers available in the laboratory. One computer must be shared among three students, while several

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others are damaged. This limitation hampers practical learning, which should be a key component of Informatics. The gap in technological infrastructure in schools is a significant obstacle to the equitable implementation of a technology-based curriculum in Indonesia. Many schools, especially in remote areas, still face limited internet access and hardware infrastructure, which directly impacts the low effectiveness of ICT utilization in education (Nazira *et al*., 2024).

Despite this, schools are striving to maximize existing facilities, such as using Google Classroom and Google Drive to share materials and assignments. Although the limited use of technology still has a positive impact, it is not yet optimal. The use of Google Classroom is well-received by students, although challenges such as uneven internet access and limited devices remain (Zulherman *et al*., 2021). The use of Google Classroom combined with interactive media can encourage active student engagement and improve learning outcomes in technology-based learning (Rohmah, 2022).

In teaching Informatics, teachers at SMAN 7 Bandung use project-based learning and discovery learning methods, which provide students with opportunities for active learning through hands-on practice. This method allows students to be more engaged in the learning process, such as when they create simple games using Scratch or assemble a computer. This approach aligns with the objectives of the Merdeka Curriculum, which emphasizes the development of 21st-century skills, including creativity, problem-solving, and collaboration. The implementation of the Project-Based Learning (PjBL) model significantly improves student learning outcomes in Informatics, with learning completion increasing from 25.81% to 93.55% after two learning cycles (Supit, Sumual, & Liando, 2024). This also occurred at SMA Negeri 4 Maros, where students' average grades increased by 26.51% after implementing the PjBL model, which not only improves learning outcomes but also encourages student creativity and active participation in the learning process (Iasya *et al*., 2024).

Significant improvements were also observed in the learning outcomes of vocational high school students in basic programming subjects after implementing the PjBL method, integrated into the Classroom Action Research model (Rahmat, 2024). His improvement was driven by group collaboration, a conducive learning environment, and the teacher's role as a facilitator in encouraging creativity and problem-solving.

Student enthusiasm for Informatics learning was also relatively high, with many students preferring to study in computer labs and engage in hands-on practice. Learning that involves hands-on experience is more effective in increasing student motivation and understanding. Learning motivation has a significant influence on student learning outcomes in Informatics (Feladi, 2022). Practice-based learning enables students to refine their skills, solve problems, and complete projects independently, demonstrating their high level of engagement in the learning process (Erwoko, 2021).

SMAN 7 Bandung has utilized digital technology despite not yet having an integrated LMS system. Informatics teachers use platforms like Google Classroom and Google Drive to manage materials and assignments, although their utilization remains limited. While this technology is not yet optimal, it still has a positive impact in supporting the learning process. Similar utilization has been found in other schools, such as SMA Muhammadiyah 1 Surakarta, which relied on Google Classroom during the COVID-19 pandemic due to its flexibility, efficiency, and ability to facilitate distance learning without face-to-face meetings. This application allows teachers to share materials, assign assignments, and conduct online assessments, and is considered quite adequate as a learning alternative amidst infrastructure limitations (Lestari & Marhamah, 2021). Therefore, although the digital resources available at SMAN 7 Bandung are still limited, their use remains relevant to support the learning process in the Merdeka Curriculumera.

However, the use of this technology is still limited to administrative functions and basic communication between teachers and students. Interactive features such as automated assessments, discussion forums, and learning progress tracking have not been fully utilized. To optimize the potential of technology in learning, schools need to consider developing a more structured LMS platform that supports deeper

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interactions between students and learning materials. As SMAN 7 Bandung implements the Merdeka Curriculum (Curriculum Merdeka), it faces several challenges, including minimal facilities and a shortage of teachers teaching Informatics. This limits the scope of learning provided, given the limited time available for practical work. Limited resources often hinder the successful implementation of technology-based curricula. Limited teacher competency in implementing the Merdeka Curriculum is a significant challenge that must be overcome to achieve the desired educational goals (Wulandari *et al*., 2025).

Nevertheless, with the school's maximum efforts to utilize existing facilities and adopt more active learning methods, such as project-based learning, SMAN 7 Bandung strives to provide students with relevant and engaging learning experiences. Adjustments made over time are key to optimal implementation of this curriculum, despite existing limitations.

CONCLUSION

Based on the research results, it can be concluded that the research objective has been achieved, namely, to provide a comprehensive overview of the curriculum's implementation and the factors influencing it. The implementation of the Merdeka Curriculum in the first year proceeded in accordance with government guidelines; however, adjustments made in the second year demonstrated the need for flexibility to address local constraints. Although the school successfully implemented project-based and discovery learning methods in line with the spirit of the Merdeka Curriculum, limited human resources and facilities continued to be a significant obstacle. This prevented the implementation of optimal learning in grade 12. This situation emphasizes that the successful implementation of the new curriculum is highly dependent on support from various aspects, particularly adequate human resources and infrastructure.

Therefore, it can be concluded that the Merdeka Curriculum at SMAN 7 Bandung is running well, but still requires improvement and development in several key aspects to ensure a more effective and comprehensive learning process. These improvements include increasing the number of teachers, upgrading facilities such as computer laboratories, and maximizing the use of learning technology. With this support, it is hoped that Informatics learning will provide a more meaningful experience for students.

For future research, it is recommended that focus be placed on unresolved issues in the school context, such as limited infrastructure and inadequate teacher numbers. Quantitative studies involving a wider range of students can be conducted to assess the effectiveness of project-based learning methods and the use of digital technology. Furthermore, it is essential to investigate the impact of teacher training and policy support from the education office on the success of curriculum implementation. Further research evaluating the use of digital learning platforms, such as Learning Management Systems (LMS), is also essential to encourage a more interactive and structured learning process that aligns with the demands of the Merdeka Curriculum. With this approach, it is hoped that the implementation of this curriculum will be more sustainable, especially in schools with similar conditions.

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REFERENCES

Adiawaty, S., Oci, M., Al-Amin, Siminto, & Ermindyawati, L. (2023). Adaptive strategies for 21st century learning: Digital literacy and learning outcomes in contemporary Indonesian higher education. *International Journal of Teaching and Learning (Injotel), 1*(2), 115-127.

Al Munawar, M. A. R., Azyan, N. I., Aurelia, S., Indriani, S., & Hadiapurwa, A. (2025). Teachers' views on optimizing kurikulum merdeka in SMK Kencana accounting department. *Hipkin Journal of Educational Research, 2*(1), 93-108.

Amanulloh, M. J. A., & Wasila, N. F. W. (2024). Implementasi dan pengembangan dalam mewujudkan pendidikan berkualitas. *Nusantara: Jurnal Pendidikan Indonesia, 4*(1), 34-53.

Asmahasanah, S., Chairunnissa, I. C., & Hakim, N. (2023). Navigating Merdeka curriculum in first grade: Teacher challenges and strategies. *Journal of Integrated Elementary Education, 3*(2), 137-149.

Astriani, M. M., & Alfahnum, M. (2022). Peningkatan kompetensi guru melalui pelatihan pengembangan media pembelajaran berbasis Videoscribe. *Jurnal PkM (Pengabdian kepada Masyarakat), 5*(3), 326-332.

Assulamy, H., Disma, D. R. I., Sulistiyaningrum, F., Aunurrahman, A., & Warneri, W. (2024). Mata pelajaran Informatika dalam kurikulum merdeka pada pendidikan kesetaraan. *Jurnal Review Pendidikan dan Pengajaran, 7*(2)*,* 4301.

Dewi, Z. R., & Sunarni. (2024). Peran literasi digital dalam implementasi kurikulum merdeka: Adaptasi dan transformasi di era digital. *Jurnal Ilmu Manajemen dan Pendidikan, 4*(1), 9-14.

Erwoko, E. (2021). Penerapan model pembelajaran problem based learning pada pelajaran Teknologi Jaringan Berbasis Luas. *Civil Officium: Journal of Empirical Studies on Social Science, 1*(1), 7-13.

Feladi, V. (2022). Pengaruh motivasi belajar terhadap hasil belajar siswa mata pelajaran Informatika kelas VII MTs Negeri 2 Pontianak. *Juwara: Jurnal Wawasan dan Aksara, 2*(1), 49-57.

Gurion, S. B. (2024). Teacher readiness in implementing “the merdeka curriculum”. *Journal of Education and Teaching (JET), 5*(1), 108-118.

Hadi, A., Marniati, R., Ngindana, R., Kurdi, M. S., Kurdi, M. S., & Fauziah, F. (2023). New paradigm of Merdeka belajar curriculum in schools. *Al-Ishlah: Jurnal Pendidikan, 15*(2), 1497-1510.

Handayani, Z. L., Hadiapurwa, A., Azzahra, D. H., & Nugraha, H. (2021). Pembaharuan strategi dan metode pembelajaran pada mata pelajaran Sejarah SMA di era pandemi COVID-19. *JKTP: Jurnal Kajian Teknologi Pendidikan, 4*(4), 329-426.

Iasya, F., Ramadhani, F., Nasir, & Fitrianti, A. (2024). Penerapan model pembelajaran project based learning untuk meningkatkan hasil belajar Informatika siswa pada siswa kelas X.4 SMA Negeri 4 Maros. *Edukatif: Jurnal Ilmu Pendidikan, 6*(1), 532-538.

Isrok’atun, I., Pradita, A. A., Ummah, S. A., Amalia, D. Y., & Salsabila, N. S. (2022). Digital literacy competency of primary school teacher education department student as the demands of 21st century learning. *Mimbar Sekolah Dasar, 9*(3)*,* 466-483.

https://doi.org/10.64014/hipkin-jer.v2i2.161

Lestari, S., & Marhamah, M. (2021). Pemanfaatan aplikasi Google Classroom sebagai alternatif dalam pembelajaran online. *Jurnal Pembangunan Pendidikan: Fondasi dan Aplikasi, 9*(2), 146-154.

Lisdawati, H., Fitria, H., & Setiyo, H. (2024). Analysis of teacher's professionalism in implementing the merdeka curriculum program at SD Negeri 3 Lembak. *Jurnal Manajemen, Kepemimpinan, dan Supervisi Pendidikan, 9*(2), 1100-1113.

Nabilah, B., Zakir, S., Murtiyastuti, E., & Mubaraq, R. I. (2022). Analisis penerapan mata pelajaran Informatika dalam implementasi kurikulum merdeka tingkat SMP. *Pijar: Jurnal Pendidikan dan Pengajaran, 1*(1), 109-118.

Nazira, U., Zahra, U., & Gusmaneli. (2024). Pemanfaatan TIK sebagai infrastruktur pendidikan: Tantangan dan peluang di era digital. *Journal of Informatics and Business Studies, 2*(3), 480-486.

Nugraha, C. A., Iskandar, R., & Baeha, P. D. (2022). Technology integration trends in hybrid learning environments in Indonesia: A systematic literature review. *Indonesian Journal of Curriculum and Educational Technology Studies, 10*(2), 67-75.

Nuridayanti, N., Muryaningsih, S., Badriyah, B., Solissa, E. M., & Mere, K. (2023). Peran teknologi pendidikan dalam implementasi kurikulum merdeka. *Journal on Teacher Education (JOTE), 5*(1), 88-93.

Pratiwi, W., Hidayat, S., & Suherman, S. (2023). Kurikulum merdeka sebagai kurikulum masa kini. *Jurnal Teknologi Pendidikan dan Pembelajaran, 10*(1), 85-95.

Rahmat, M. N. (2024). Pemanfaatan model pembelajaran Project Based Learning (PjBL) untuk mengasah kreativitas dan meningkatkan hasil belajar siswa pada mata pelajaran Dasar Pemrograman. *MediaTIK: Jurnal Media Pendidikan Teknik Informatika dan Komputer, 7*(3), 17-22.

Rohmah, M. (2022). Penggunaan media Google Classroom berbantu Liveworksheets untuk meningkatkan hasil belajar IPA materi kemagnetan siswa SMP. *Edutech: Jurnal Inovasi Pendidikan Berbantuan Teknologi, 2*(1), 16-26.

Setyawan, A. E., Lisa, Y., & Agustini, A. J. (2024). Analisis implementasi kurikulum merdeka belajar pada program keahlian Rekayasa Perangkat Lunak (RPL) di SMK. *Jurnal Konatif: Jurnal Ilmiah Pendidikan, 2*(2), 137.

Sitorus, F. R., Waruwu, K. K., & Febry, A. (2023). Analisis penerapan kurikulum merdeka belajar pada tingkat sekolah menengah atas. *Jurnal Pendidikan West Science, 1*(6), 328-334.

Sucipto, S., Sukri, M., Patras, Y. E., & Novita, L. (2024). Tantangan implementasi kurikulum merdeka di sekolah dasar: Systematic literature review. *Kalam Cendekia: Jurnal Ilmiah Kependidikan, 12*(1), 280-289.

Supit, Y. A., Sumual, H., & Liando, O. E. S. (2024). Penerapan model pembelajaran project based learning untuk meningkatkan hasil belajar Informatika siswa kelas X SMK Kristen Imanuel Laikit. *EduTIK: Jurnal Pendidikan Teknologi Informasi dan Komunikasi, 4*(3), 259-266.

Wulandari, D., Sa'diyah, L. L., Ummah, N. S., Dewi, S., & Hariyanto, E. (2024). Implementasi kurikulum merdeka pada SMA sebagai sekolah penggerak. *Jurnal Ilmiah Pendidikan dan Pembelajaran, 2*(2), 72-78.

Wulandari, H., Mulyasari, E., Hendriawan, D., Sugiarti, D., & Abuluruq, R. K. H. (2025). Keterbatasan kompetensi guru dalam implementasi kurikulum Merdeka: Studi kasus di SDN Sanding 2. *Kalam Cendekia: Jurnal Ilmiah Kependidikan, 13*(1), 208-216.

https://doi.org/10.64014/hipkin-jer.v2i2.161

Yasmansyah, Y., & Sesmiarni, Z. (2022). Konsep merdeka belajar kurikulum merdeka. *Jurnal Penelitian Ilmu Pendidikan, 1*(1)*,* 1-10.

Zamista, A. A., & Deswita, P. (2023). Perceptions of Indonesian teachers on the implementation of "Merdeka" curriculum. *Wiyata Dharma: Jurnal Penelitian dan Evaluasi Pendidikan, 11*(1), 13-25.

Zulherman, Z., Zain, F. M., Napitupulu, D., Sailin, S. N., & Roza, L. (2021). Analyzing Indonesian students' Google Classroom acceptance during COVID-19 outbreak: Applying an extended unified theory of acceptance and use of technology model. *European Journal of Educational Research, 10*(4), 1697-1710.

https://doi.org/10.64014/hipkin-jer.v2i2.161

https://doi.org/10.64014/hipkin-jer.v2i2.161