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Multifaceted pedagogical framework for informatics: SMP Labschool UPI perspective

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ABSTRACT

Within the Kurikulum Merdeka framework, Informatics learning occupies a strategic position as a subject that supports the development of 21st-century competencies. The purpose of this study is to examine how curriculum elements, learning models, learning media, and evaluation strategies are applied in Informatics learning at SMP Labschool UPI, particularly within the flexible Kurikulum Merdeka context. This study employed a qualitative, descriptive approach, using data collection methods such as classroom observations and in-depth interviews with Informatics teachers. The results show that teachers can independently develop lesson plans, adapt materials to students' needs, and implement various learning models, including project-based, scientific, and inquiry-based learning. The materials focused on computational thinking, Information and Communication Technology (ICT), data analysis, and the social impact of technology. The learning media included digital resources and traditional tools, and the evaluation strategy employed a backward design approach, incorporating diagnostic assessments, quizzes, reflections, and project-based assessments. This study concluded that Informatics learning under the Kurikulum Merdeka is adaptive and contextual, and can accommodate students' needs in the digital era.

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ABSTRAK

Dalam kerangka Kurikulum Merdeka, pembelajaran Informatika menempati posisi strategis sebagai mata pelajaran yang mendukung pengembangan kompetensi abad ke-21. Tujuan dari penelitian ini adalah untuk menjelaskan dan menganalisis bagaimana elemen kurikulum, model pembelajaran, media belajar, dan strategi evaluasi diterapkan dalam pembelajaran Informatika di SMP Labschool UPI, khususnya dalam konteks Kurikulum Merdeka yang fleksibel. Penelitian ini menggunakan pendekatan kualitatif dengan metode deskriptif, melalui teknik pengumpulan data berupa observasi kelas dan wawancara mendalam dengan guru Informatika. Hasil penelitian menunjukkan bahwa guru dapat menyusun RPP secara mandiri, menyesuaikan materi dengan kebutuhan murid, dan menerapkan model pembelajaran yang bervariasi seperti pembelajaran berbasis proyek, pembelajaran ilmiah, dan berbasis inkuiri. Materi difokuskan pada berpikir komputasional, teknologi informasi dan komunikasi (TIK), analisis data, dan dampak sosial teknologi. Media pembelajaran yang digunakan mencakup sumber digital dan alat bantu tradisional, sedangkan strategi evaluasi mengikuti pendekatan backward design melalui asesmen diagnostik, kuis, refleksi, dan asesmen berbasis proyek. Studi ini menyimpulkan bahwa pembelajaran Informatika di bawah Kurikulum Merdeka bersifat adaptif, kontekstual, dan mampu mengakomodasi kebutuhan murid di era digital.

Kata Kunci: *evaluasi pembelajaran; Kurikulum Merdeka; pembelajaran informatika*

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INTRODUCTION

The implementation of the *Kurikulum Merdeka* in primary and secondary education units in Indonesia since the 2021/2022 Academic Year has presented both challenges and opportunities for schools in developing more flexible and contextualized learning processes. This curriculum has been implemented in nearly 2,500 *Program Sekolah Penggerak* (PSP) schools and 901 *SMK Pusat Keunggulan* (SMK PK), encompassing levels from TK-B, Grade I and IV of SD and SDLB, Grade VII of SMP and SMPLB, as well as Grade X of SMA, SMALB, and SMK. In the 2022/2023 Academic Year, schools were given options for implementing the *Kurikulum Merdeka* based on their respective levels of readiness, namely: (1) applying selected principles without replacing the previous curriculum; (2) using the provided instructional tools; or (3) independently developing instructional tools. This flexibility serves as the main foundation for the implementation of the *Kurikulum Merdeka* (Rahmawati *et al*., 2023).

Within the *Kurikulum Merdeka* framework, Informatics learning occupies a strategic position as a subject that supports the development of 21st-century competencies, such as computational thinking, digital literacy, and data analysis skills. This is particularly important given the rapid advancement of information and communication technology, which affects various aspects of life and the future world of work. The *Kurikulum Merdeka* provides space for schools and teachers to develop Informatics learning that is adaptive, creative, and aligned with students' needs and characteristics (Fajari *et al*., 2024). Therefore, Informatics learning is not merely a transfer of technical knowledge but also fosters critical thinking skills, problem-solving abilities, and awareness of the social impacts of technology. The flexibility of the *Kurikulum Merdeka* influences the implementation of various subjects, including Informatics, which has now become an essential component of the national curriculum. Informatics education emphasizes the development of computational thinking skills, understanding of information and communication technology (ICT), data analysis, and awareness of the social effects of technology (Kusumastuti *et al*., 2024).

Various studies have examined the implementation of the *Kurikulum Merdeka* across different subjects. For instance, the implementation of the *Kurikulum Merdeka* in Science subjects has been found to encourage teachers to be more creative in selecting learning models that align with students' characteristics (Priantini *et al*., 2022). Challenges faced by teachers in understanding and developing instructional tools in Mathematics subjects have also been identified, particularly those related to limited resources and training opportunities (Siswanto *et al*., 2022). Although these studies contribute to the understanding of *Kurikulum Merdeka* implementation, their focus has not specifically addressed Informatics learning at the junior secondary school (SMP) level. In fact, comprehensive monitoring of curriculum implementation is essential to ensure that learning objectives are optimally achieved (Firdaus *et al*., 2024). The success of curriculum innovation is highly dependent on systemic support and teaching practices at the school level. However, studies examining the implementation of practical learning strategies such as project-based learning (PjBL) and problem-based learning (PBL) by teachers in real classroom settings, particularly in Informatics subjects, remain relatively limited. Although the *Kurikulum Merdeka* approach in Informatics/ICT subjects has been implemented, further exploration of teachers' actual classroom practices is still required (Farhan *et al*., 2023).

Responding to this gap, the present study contributes new insights by presenting a concrete case study of Informatics learning practices at SMP Labschool UPI within the *Kurikulum Merdeka* context. This school was selected as it is one of the university laboratory schools that actively serves as a site for experimentation and the development of innovative learning models; therefore, curriculum implementation at this school reflects best practices that have the potential to be replicated in other schools. This study integrates various active learning models, the use of digital media, and learning approaches tailored to students' interests and talents. Furthermore, this research examines the relationship between learning

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evaluation and the process of students' digital project development, a dimension that has received limited attention in previous studies. Accordingly, this study offers a novel contribution to understanding the interrelationship between learning models, evaluation strategies, and students' digital project outcomes within the context of Informatics learning based on the *Kurikulum Merdeka*. The primary objective of this study is to conduct an in-depth investigation of Informatics teaching methods at SMP Labschool UPI within the *Kurikulum Merdeka* framework, particularly focusing on curriculum components, learning models, learning media and resources, and the evaluation practices implemented by Informatics teachers.

LITERATURE REVIEW

Kurikulum Merdeka and Informatics Education at the Junior Secondary School Level

The Decree of the Minister of Education, Culture, Research, and Technology of the Republic of Indonesia Number 262/M/2022 states that the learning principles within the *Kurikulum Merdeka* are designed by taking into account students' developmental stages and capacities to become lifelong learners, to possess competencies relevant to their environment, and to be future-oriented. This policy grants each educational unit the autonomy to design its own operational curriculum and learning plans. Therefore, the development of creative learning processes is required to respond to the challenges of education in the current era of digitalization (Nasution *et al*., 2023).

One of the compulsory subjects at the junior secondary school (SMP) level is Informatics, which emphasizes the strengthening of computational thinking skills. Through Informatics education, digital literacy—highly relevant to contemporary needs—can be effectively developed. Informatics not only teaches the use of computers but also cultivates computational abilities such as logical and systematic thinking, as well as skills in processing and utilizing data (Idris, 2023).

In contrast to the importance of implementing Informatics as a subject, there are still educational units in Indonesia that are not yet prepared to offer Informatics instruction. The main reason is the limited readiness of teachers to teach Informatics. This situation needs to be addressed by providing competency-based training for teachers or recruiting teachers with an undergraduate background in Informatics. The provision of facilities and infrastructure, such as computer laboratories and internet access, also requires serious attention (Wahdini *et al*., 2024).

Innovative Learning Models in Informatics

In Informatics learning, several instructional models can be applied, as described below.

1. Project-Based Learning (PjBL)
   Project-Based Learning (PjBL) is a student-centered learning model. Students are involved in the processes of designing, implementing, and evaluating a project, and are expected to collaborate and develop skills to solve problems and foster independent learning. In addition, students' sense of responsibility is also developed, as completed projects are typically required to be presented in class (Ahmad *et al*., 2023; Nadila *et al*., 2025; Silva *et al*., 2021).
2. Problem-Based Learning (PBL)
   Problem-Based Learning (PBL) is a learning model that is closely related to real-world problems. The characteristics of this model include: (1) requiring activities such as listening, note-taking, memorization, critical thinking, communication, and accurate data searching and processing, which ultimately lead to drawing conclusions for problem-solving; (2) requiring the presence of a problem to be solved, which serves as the core of the learning activity, without a problem to solve, no learning activity occurs; and (3) requiring the use of a scientific thinking approach to resolve problems (Hendarjo, 2022).

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3. Flipped Classroom
   This model enables the optimization of learning by allowing students to study learning materials independently outside the classroom through videos or reading materials, while classroom time is used for discussion, collaboration, and problem-solving under the guidance of the teacher (Kurniawan *et al*., 2020). This process encourages students to actively construct knowledge independently, monitor, and evaluate their learning outcomes, rather than passively receiving information from the teacher. Furthermore, when students engage in collaborative activities in the classroom, an exchange of ideas occurs, enabling them to gain new perspectives and ultimately find solutions to problems within a given topic (Widiantika *et al*., 2025).
4. Scientific Learning
   This model aims to enable students to understand and master learning content through modules using a scientific approach. Students are expected to independently construct concepts and principles through stages of observing, formulating problems, proposing hypotheses, collecting information using various methods, analyzing information, drawing conclusions, and communicating the concepts, laws, or principles discovered (Setyani *et al*., 2022).
5. Inquiry
   This model directs students to solve problems by providing learning stimuli that encourage them to develop an interest in studying materials they initially perceive as difficult. Learning begins with problem formulation, followed by hypothesis development, evidence collection, drawing and testing conclusions, until the conclusions are considered valid. This method makes students more active and enthusiastic in the learning process (Nababan & Sihombing, 2023).

Digital Media and Learning Resources in Informatics Learning

Innovative learning can be effectively implemented with the support of instructional media. Instructional media may take the form of any objects or events that can be utilized by students to facilitate learning, thereby making the learning process more effective and efficient. Learning media can deliver content in the form of films, videos, slides, or other formats that help students better understand the material (Pratasik & Ahyar, 2022). Some of the commonly used media include Kahoot, Quizizz, Scratch, and digital comics. The use of such media encourages students to become more active, engaged, and motivated to learn, as these media can be accessed anytime and anywhere (Lestari, 2024; Nuralizza *et al*., 2023).

Evaluation of Informatics Learning Based on the *Kurikulum Merdeka*

Within the *Kurikulum Merdeka*, two assessment terms are used to evaluate learning: summative assessment, which is conducted to assess students' achievement and to determine grade promotion and graduation, and formative assessment, which is used to obtain information about students who experience learning barriers or difficulties as well as students' learning progress (Rahmadani *et al*., 2024). Based on the results of these assessments, teachers can plan appropriate learning activities in accordance with students' needs, which in turn also strengthens the process of reinforcing the *Profil Pelajar Pancasila* (Antika *et al*., 2023).

METHODS

This study employed a qualitative approach using a case study method that focused on the teaching practices of the Informatics subject at SMP Labschool UPI. Data were collected over a four-day period using several data collection techniques, namely: (1) participatory observation of classroom learning

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processes; (2) in-depth interviews, audio-recorded, with an Informatics teacher to obtain detailed insights into curriculum implementation and instructional methods; and (3) document analysis of instructional materials such as Lesson Plans (*Rencana Pelaksanaan Pembelajaran* / RPP) and the learning modules used.

The collected data were subsequently analyzed using thematic analysis techniques, involving processes of data coding, pattern identification, and the development of major themes that describe teaching practices and their relationship to the implementation of the *Kurikulum Merdeka*. This procedure followed recent practical guidelines specifically within the context of educational research, as described by Khusnir in the book *"Thematic Analysis in the Area of Education: A Practical Guide"*, which provides a comprehensive and reflective framework for systematic and valid analysis in qualitative educational research. Data triangulation was also conducted by comparing findings from interviews, observations, and document analysis to strengthen the validity and accuracy of the results. This study also considered teachers' modifications or adaptations in the teaching process to accommodate students' needs and classroom conditions, ensuring that learning remained relevant, dynamic, and contextual in accordance with contemporary developments.h

RESULTS AND DISCUSSION

Selective Strategy in Content Selection

The results of the analysis indicate that out of the eight main content areas of the Informatics subject, SMP Labschool UPI focuses on only four core topics, namely Computational Thinking, Information and Communication Technology (ICT), Data Analysis, and the Social Impact of Informatics. This content selection is adjusted to the classroom context and the available allocation of instructional time. The teacher stated,

> *"Kami tidak mengajarkan seluruh elemen setiap semester kepada murid karena memang waktunya terbatas dan kami ingin para murid fokus pada beberapa materi saja namun mereka bisa menguasai, jadi kami pilih elemen yang bisa dikaitkan dengan proyek-proyek yang relevan dengan kehidupan nyata," (Informatics Teacher at SMP Labschool UPI, personal communication)*

These core materials are summarized in **Table 1** below.

Table 1. Informatics Content for Junior Secondary School Based on the 2021 Kurikulum Merdeka

No	Content
1	Computational Thinking
2	Information and Communication Technology
3	Computer Systems
4	Computer Networks and the Internet
5	Data Analysis
6	Algorithms and Programming
7	Social Impact of Informatics
8	Cross-Disciplinary Practice

Source: Modul Informatika SMP Kelas VIII Grafindo Media Pratama by Imas Rahayu & Miraz Nasahor

Table 1 illustrates the structure of Informatics content that serves as the basis for selecting instructional focus. Each content area plays a strategic role. **Computational Thinking,** for instance, serves as a fundamental component of the curriculum, as it encourages students to develop systematic, logical, and

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creative ways of thinking in problem-solving. By training skills such as decomposition, abstraction, pattern recognition, and algorithmic thinking, this content becomes the foundation for mastering other digital skills, including programming and data analysis. Furthermore, **Information and Communication Technology (ICT)** functions as an initial bridge for students to become familiar with and productively utilize technological tools. Within this content area, students are introduced to basic applications such as word processors, spreadsheets, presentation software, and the use of the internet for learning and communication. **Computer Systems** complement students' understanding by introducing how hardware and software operate and interact within an integrated computational system. This understanding is not only technically important but also contributes to the development of deeper digital literacy among students. The content area of **Computer Networks and the Internet** provides insights into how computers are interconnected, including concepts of local and global networks, as well as the importance of security and ethics in the cyber domain. Meanwhile, **Data Analysis** encourages students to engage in evidence-based thinking, process data from various sources, and present the results in visual forms such as tables and graphs. This content is often integrated with the use of software tools such as Microsoft Excel or Google Sheets, which not only strengthen numerical skills but also enhance digital literacy competencies.

Algorithms and Programming constitute one of the most challenging yet engaging components, as students are guided to construct logical instructions to create digital solutions. Through visual programming languages such as Scratch or basic-level Python, students learn how computers execute commands and how they can create simple digital products, such as educational games or simulations. Meanwhile, the **Social Impact of Informatics** serves as a reminder that technology is not solely about technical competence but also involves ethical responsibility. This content broadens students' perspectives on issues such as personal data security, cyberbullying, misinformation, and digital footprints. Finally, **Cross-Disciplinary Practice** represents an innovative approach in Informatics learning that promotes collaboration across subjects. For example, students may develop projects that integrate science and technology, such as simulating scientific experiments using digital software or creating data visualizations from social survey results. This approach aims to build connections across disciplines and provide opportunities for students to apply Informatics skills in broader and more relevant contexts.

Implemented Learning Methods

Classroom observation results indicate that SMP Labschool UPI implements learning models that are tailored to the subject matter and students' characteristics, such as Project-Based Learning (PjBL), scientific learning, and inquiry-based learning. These learning models are considered effective because they enhance students' engagement in the learning process. During one observation session, the teacher was observed guiding students to create a digital product in the form of an interactive presentation on the use of data in their surrounding environment. Students expressed their enthusiasm by stating,

> *"Saya suka proyek ini karena bisa langsung cari data dari rumah dan lingkungan sekitar, terus dibahas di kelas," (Student of SMP Labschool UPI, personal communication)*

This project-based learning approach is regarded as effective in increasing students' involvement in the learning process. The teacher stated,

> *"Kalau pakai proyek, murid lebih aktif dan ide mereka keluar sehingga memunculkan kreativitas di diri mereka. Saya tinggal memfasilitasi dan arahkan supaya tetap sesuai tujuan pembelajaran," (Informatics Teacher at SMP Labschool UPI, personal communication)*

Teachers at SMP Labschool UPI also frequently combine inquiry-based learning and scientific learning models to foster students' scientific thinking processes and exploratory skills within the scope of Informatics content. In practice, the selection of learning models is adjusted to the characteristics of the material. For instance, in ICT and data analysis topics, teachers still employ lecture methods,

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demonstrations, and video-based tutorials to build students' foundational understanding. Meanwhile, for conceptual or socially oriented topics, such as the impact of misinformation in social informatics, case-based approaches and group discussions are considered more effective. This combination of learning models reflects flexibility in managing Informatics instruction that is adaptive to classroom conditions and students' needs. This finding indicates that teachers do not merely act as facilitators, but also as designers of learning experiences within the school context (Arfandi & Samsudin, 2021).

Integration of Media and Learning Resources

Based on the findings, the learning resources used by teachers are illustrated in **Figure 1** below.

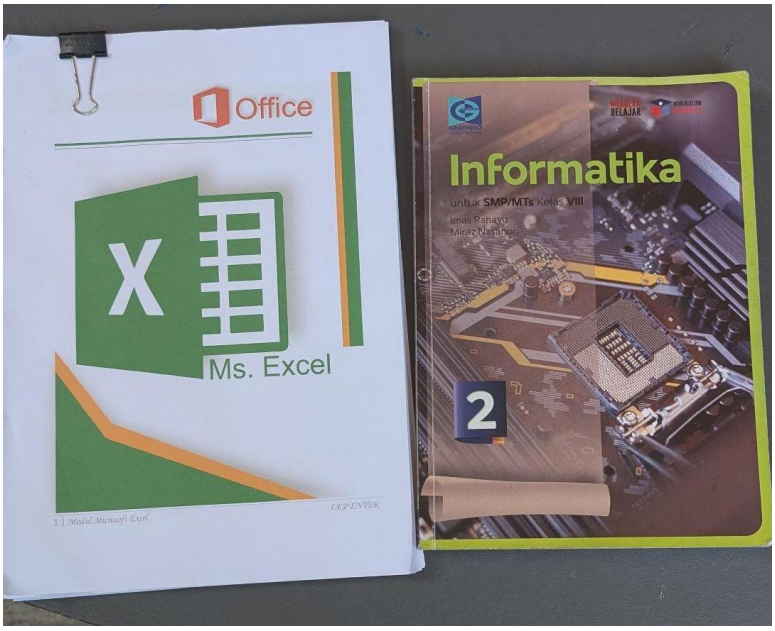

Figure 1. Learning Resources Used at SMP Labschool UPI
Source: Teachers of SMP Labschool UPI

Figure 1 presents two main modules used by Informatics teachers at SMP Labschool UPI, namely the *"Data Processing with Excel Module"*, which was developed directly by the Informatics teachers at the school, and the *"Kurikulum Merdeka Informatics Module"* published by Grafindo Media Pratama and authored by Imas Rahayu and Miraz Nasahor. Both modules were systematically designed by teachers to support project-based and problem-solving-oriented learning activities. The Excel module is used to strengthen students' skills in numerical data analysis, while the Informatics module serves as a learning guide covering topics such as computational thinking, the social impact of Informatics, and other related content. The presence of these modules demonstrates that teachers play an active role in developing learning resources that align with the context and needs of students (Arinie & Azmah, 2025).

Furthermore, the instructional media used are integrated with digital technologies such as video tutorials, Scratch applications, Kahoot and Quizizz platforms, as well as visual aids such as hard disks and digital illustrations, depending on the subject matter. Students described their learning experiences with diverse media as follows:

> *"Kadang kami belajar pakai modul dari sekolah, kadang juga cari sendiri lewat internet kalau diminta eksplorasi topik tertentu," (Student of SMP Labschool UPI, personal communication).*

The diversity of media reflects teachers' efforts to adapt instructional methods to the needs of the digital generation. In this regard, teachers do not rely solely on curriculum materials but also align learning with

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current issues and students' interests. The use of these applications not only introduces concepts but also promotes basic digital skills, creativity, and problem-solving abilities (Hilmiah & Salehudin, 2024).

Evaluation and Reflection Practices

Observation results indicate that SMP Labschool UPI applies the principle of backward design in conducting evaluations, whereby assessment is planned prior to the implementation of instruction. The evaluation practices applied are as follows.

1. Diagnostic Assessment
   The activity conducted in this assessment is a pre-test, which is used to identify students' readiness and to adjust appropriate instructional strategies.
2. Formative Assessment
   The activities conducted in this assessment include quizzes and reflections, which enable students to evaluate their own learning processes and the outcomes of their work.
3. Final Project-Based Summative Assessment

   The activities conducted in this assessment include the development of simple applications, digital presentations, and programming simulations, which are used to measure students' cognitive, affective, and psychomotor domains, in line with the assessment for learning framework.

Discussion

Selective Content Strategy from a Digital Literacy Perspective

The implementation of the Informatics curriculum at SMP Labschool UPI, which focuses on key content areas such as Computational Thinking, Information and Communication Technology (ICT), Data Analysis, and the Social Impact of Informatics, reflects an educational approach that is adaptive to the digital literacy needs of the 21st century. The findings of this study indicate that when Informatics content is taught in a structured and contextual manner, students not only understand fundamental concepts but are also able to apply them in real-life situations. Computational Thinking content, which emphasizes systematic problem-solving abilities, makes a significant contribution to the development of students' critical and creative thinking skills. This finding is consistent with studies indicating that computational thinking can assist students in solving mathematical problems in a systematic and logical manner (Budiarti *et al*., 2022). Computational thinking skills are also correlated with students' self-concept in mathematics, particularly among students with high initial abilities, highlighting the importance of introducing this content early in the curriculum to support more complex cognitive development at subsequent educational levels (Aliyah *et al*., 2022).

Meanwhile, ICT content strengthens students' technical foundations in using both software and hardware. The introduction of basic applications such as word processing, presentation tools, and file management via the internet serves as essential preparation for students to engage in learning across various subjects. The integration of ICT into the teaching and learning process has been shown to enhance learning motivation and expand students' access to information (Puteri *et al*., 2025). At SMP Labschool UPI, ICT learning also introduces students to broader digital literacy concepts, including cybersecurity and ethical technology use. Through this approach, students are prepared not only as technology users but also as individuals who are capable of managing information responsibly.

The strengthening of analytical skills through Data Analysis content also emerges as a key finding. Students are trained to process and interpret data using tools such as Microsoft Excel, which not only

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support numerical competencies but also develop data-driven decision-making skills. This result aligns with research indicating that data-based learning can enhance reasoning abilities and the capacity to make logical generalizations among students (Sianturi, 2021). Students tend to demonstrate high levels of interest in data processing practices when the tasks are relevant to their daily lives, such as projects involving the analysis of survey data on students' interests or data from their surrounding environment. This finding illustrates that Data Analysis content not only improves technical skills but also actively engages students in the learning process.

Ethical aspects of technology use are also addressed through instruction on the social impact of Informatics. This content plays a crucial role in fostering students' awareness of the social consequences of digital technology use. Students are encouraged to reflect on phenomena such as the spread of misinformation, cyberbullying, and social media addiction, and are guided to develop critical and responsible attitudes. Such forms of digital literacy should indeed serve as a means of strengthening character education in the contemporary societal context, not merely teaching technical skills but also instilling accompanying ethical values (Dewi, 2021). Through reflective approaches and case-based discussions, students at SMP Labschool UPI are not only positioned as technology users, but also as individuals who are conscious of its impacts on society and their social environment.

Effectiveness of Active Learning Models

Compared to previous findings indicating that Informatics learning at the junior secondary school level remains largely limited to the use of basic software and conventional approaches, the observation results at SMP Labschool UPI demonstrate positive developments. Teachers are able to implement more varied learning models such as Project-Based Learning (PjBL), Problem-Based Learning (PBL), and Inquiry, which have been shown to support students' creativity and problem-solving skills (Ahmad *et al*., 2023; Hendarjo, 2022; Nababan & Sihombing, 2023; Nadila *et al*., 2025; Silva *et al*., 2021). This finding aligns with research emphasizing the importance of teacher flexibility and autonomy in adapting instructional approaches to students' needs and to continuously evolving social contexts (Farhan *et al*., 2023).

Integration of Digital Media and Its Impact

The use of digital media such as simulations, animations, digital comics, and interactive software makes Informatics learning more engaging, applicable, and relevant to students' lives. Digital media have been shown not only to enhance enjoyment, learning interest, and conceptual understanding, but also to foster students' critical thinking skills when appropriately integrated into the learning process (Gumelar *et al*., 2021; Nuralizza *et al*., 2023). The successful integration of such media is highly dependent on teachers' ability to design contextualized learning experiences and to select media types that align with the characteristics of the content and intended learning outcomes. In this regard, teachers serve as both designers and facilitators who must be capable of managing digital-based media effectively (Arif *et al*., 2023; Nurafrilian *et al*., 2022). Moreover, teachers' understanding of digital communication strategies is essential to ensure that instructional messages are optimally conveyed through various digital platforms and formats (Priyowidodo *et al*., 2021).

Evaluation Practices as Authentic Assessment

The evaluation of Informatics learning encompasses cognitive, affective, and psychomotor domains, in accordance with the holistic approach of the *Kurikulum Merdeka*. Innovation in evaluation practices is crucial for assessing competencies comprehensively, particularly in the digital era, which demands technology-enhanced learning. The use of authentic assessment instruments such as digital projects,

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online portfolios, and technology-based evaluation platforms such as Quizizz and e-learning systems has become increasingly relevant for measuring conceptual understanding, practical skills, and students' attitudes toward the responsible use of technology (Arninda, 2022; Putra *et al*., 2024; Wahyudi, 2024). In addition, approaches such as PBL, reflection, and project-based assessment have been shown to be effective in enhancing students' motivation and engagement in Informatics subjects, which in turn improves the overall quality of evaluation (Hendarjo, 2022).

CONCLUSION

The implementation of Informatics learning at SMP Labschool UPI within the *Kurikulum Merdeka* framework demonstrates a comprehensive and mutually reinforcing integration of curriculum components, learning models, media and learning resources, and evaluation systems. The curriculum tools developed by teachers based on the principles of flexibility and depth allow for adaptation to students' characteristics and learning contexts, thereby making the taught content more relevant and meaningful. This approach addresses the need for criteria that emphasize not only content mastery but also the development of competencies aligned with technological advancement and 21st-century demands.

In terms of learning model implementation, the findings indicate that project-based and scientific approaches effectively support the achievement of objectives related to strengthening students' critical, creative, collaborative, and problem-solving skills. These models function not merely as instructional methods, but also as strategic means of connecting Informatics content with real-life situations, ensuring that Informatics learning is not detached from students' everyday experiences. The content focus includes Computational Thinking, Information and Communication Technology (ICT), Data Analysis, and the Social Impact of Technology. The digital media employed by teachers, ranging from interactive applications to self-developed modules, further enhance learning outcomes by accommodating diverse learning styles and students' interests. Project-based evaluation, accompanied by formative and summative assessments, has encouraged students not only to understand concepts but also to produce authentic work and reflect on their learning processes.

This study successfully addresses the research questions concerning how curriculum tools are designed and implemented, the learning models applied, the media and learning resources selected, and the evaluation systems employed by Informatics teachers in the implementation of the *Kurikulum Merdeka*. Overall, the findings illustrate that the success of this implementation is highly dependent on synergy among curriculum implementation, innovative teachers, and infrastructural support. However, this study also reveals challenges related to limited instructional time, variations in students' readiness, and disparities in access to technology outside the school environment, all of which require careful consideration in efforts toward continuous improvement. Future research is recommended to involve a wider range of school characteristics and to incorporate the perspectives of students and parents in order to obtain a more comprehensive understanding of the effectiveness of *Kurikulum Merdeka*-based Informatics learning.

AUTHOR'S NOTE

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