The Utilization of the Independent Learning Platform (PMM) in Supporting Science Learning and the Implementation of the Independent Curriculum

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Abstract: I The implementation of the Independent Curriculum through the use of the Independent Teaching Platform (PMM) at SMK Negeri 6 Padang faces a number of challenges, such as teachers' lack of understanding of the curriculum, limited content in the PMM feature, and limited internet access in schools. This study aims to analyze the use of self-development, teaching, and inspiration features in the implementation of the Independent Curriculum in vocational schools. The results showed that although teachers have taken advantage of the PMM feature, only a few features such as self-training, performance management, CP/ATP, teaching tools, and inspirational videos are used optimally, while other features have not been maximized due to limited content and are still in the development stage. Factors that support the use of PMM include professional development features, collaboration in the development of teaching materials, and career opportunities, while obstacles faced include limited technology skills, limited time, and lack of motivation for teachers to participate in training. To overcome these barriers, it is necessary to conduct regular training to improve teachers' digital skills, proportionate workload management, improve PMM features, and develop materials relevant to learning needs, as well as increase teachers' awareness that training and seminars are not just for certification.

Keywords: Independent curriculum; Independent teaching platform; Vocational school

Introduction

The Merdeka Curriculum is an innovation in the Indonesian education system that aims to improve the quality of education (Fauzan et al., 2023; Hikmah & Wiharja, 2025). This curriculum is structured with a new paradigm that allows learning to be adjusted to the competencies of students, their characteristics, and the local context that includes the environment, culture, and surrounding customs (Zendrato & Agatha, 2023). This aims to make the material delivered more relevant and effective in helping students master important concepts and develop their potential optimally (Rahmadani et al., 2023; Batubara et al., 2024)

One of the important aspects of the Independent Curriculum is to give schools the authority to adapt learning to the needs and culture of each school (Retnowati et al., 2024). The implementation of the Independent Curriculum is facilitated by the Independent Teaching Platform (PMM), a digital platform developed by the Indonesian Ministry of Education, Culture, Research, and Technology (Prasetyaningsih et al., 2024; Ro'fah et al., 2024; Setiariny & Sanmarwi, 2024)

PMM provides a variety of features that are useful for teachers and principals, including curriculum references, learning tools, training modules, and discussion forums to share experiences (Prahastina et al., 2024). These features aim to support the development of teacher professionalism and improve the quality of learning that is more interactive and relevant to the needs of (Latip et al., 2024; Lindawati et al., 2025). In addition, this platform also provides access to the latest news and information on educational developments, making it easier for teachers to always stay up to date with the latest developments in education.

Since its introduction in the 2022/2023 school year, PMM has been widely used throughout Indonesia. Based on the survey results, the use of PMM has been proven to be effective in helping teachers improve their understanding of the Independent Curriculum, develop learning tools, and improve the overall quality of learning (Rahmadani & Kamaluddin, 2023; Suci et al., 2024). However, in its implementation, there are several obstacles faced, such as the lack of teachers' understanding of the Independent Curriculum, the limitations of learning tools that are in accordance with the curriculum, and problems related to internet access and digital devices in schools (Adawiyah et al., 2024; Andriani & Widiyono, 2024; Astuti et al., 2025; Hasballah & Zulfatmi, 2024).

At SMK Negeri 6 Padang, even though PMM has been implemented, its utilization is still not optimal. One example found is the limited material on science lessons for vocational schools available on the platform. Some teachers revealed that the features in PMM are not fully accessible, and there are still technical constraints that limit the use of this platform in supporting learning to the fullest. Teachers also revealed that although some training features are available, many of them are not yet suitable for the specific needs of the material they are teaching (Pebrika et al., 2024; Ambawani et al., 2023; Ionescu & Vrăsmaș, 2023).

At SMK Negeri 6 Padang, it was found that another challenge faced was the lack of understanding of how to optimize this platform in daily learning. Some teachers admit that they often use PMM just to get a certificate or fulfill administrative obligations, rather than to improve the quality of their teaching. Therefore, this study aims to learn more about the implementation of PMM in the field, especially at SMK Negeri 6 Padang, to find solutions related to the problems faced in the use of this platform.

As part of efforts to optimize the use of PMM, this study will also identify the specific needs faced by teachers in vocational schools, especially in terms of curriculum development and the use of features in the platform. This is important to ensure that this platform can be used optimally to support the Independent Curriculum and improve the quality of learning in vocational schools (Hakim & Abidin, 2024; Sari et al., 2024). By understanding the challenges faced and evaluating the implementation of PMM at SMK Negeri 6 Padang, it is hoped that a more effective solution can be found in optimizing the use of this platform, in order to better support teacher competency development and improve student learning outcomes. This research is expected to contribute to the development of more appropriate education policies in the context of learning based on the Independent Curriculum in vocational schools (Marsaulina et al., 2023; Sulistio et al., 2024).

Method

This research employs a qualitative descriptive approach that aims to provide an objective and comprehensive understanding of the actual conditions of the research subjects (Doyle et al., 2020; Villamin et al., 2025). Qualitative research is known as naturalistic research because it is conducted in real and natural settings without any intervention from the researcher, thereby allowing the study to capture the social dynamics and context as a whole (Borg, 2024; Davis et al., 2021).

The study was conducted at SMKN 6 Padang, selected based on its readiness and active engagement in using the Platform Merdeka Mengajar (PMM) within the learning process. This site was chosen purposively to illustrate how the implementation of the Independent Curriculum and the utilization of PMM take place in real classroom contexts, consistent with purposive sampling commonly applied in qualitative naturalistic research (Fadli, 2021; Furidha, 2024)

The key data in this qualitative research were obtained through verbal expressions and observable behaviors, supported by both primary and secondary data (Arikunto, 2013). Primary data were gathered from general subject teachers as the main actors in curriculum implementation, while secondary data were obtained from school principals and curriculum representatives who provided insights into policy and management aspects. Such diverse data sources enhance the depth and credibility of findings by reflecting multiple perspectives (Ann Cutler et al., 2021)

Data collection was carried out through in-depth interviews, observations, and documentation, enabling the researcher to collect rich and comprehensive information. Data were then analyzed using the interactive model proposed (Sugiyono, 2017), which involves three concurrent stages: data reduction, data display, and conclusion drawing/verification.

To ensure data credibility, triangulation of sources, techniques, and time was conducted (Sugiyono, 2018). This process verifies the consistency and accuracy of the

information obtained from multiple perspectives, ensuring the validity and reliability of the findings.

Research Flow/Design

The flow of this research can be described as follows:

a) Premliminery Study

The researcher conducted a preliminary observation and literature review to identify problems related to the implementation of the Independent Curriculum and the use of PMM.

b) Site and Participant Selection

SMKN 6 Padang was chosen purposively based on its readiness and involvement in PMM-based learning. Participants included teachers, principals, and curriculum representatives.

c) Data Collection

Data were collected through in-depth interviews, classroom observations, and documentation related to learning activities and school policies.

d) Data Analysis

The collected data were analyzed using the interactive model (data reduction, data display, conclusion drawing). This process was iterative, meaning data were continuously refined as new insights emerged.

e) Data Validation

Validation was conducted through triangulation of data sources, techniques, and time to ensure credibility and accuracy.

f) Conclusion and Reporting

The final stage involved drawing conclusions and compiling a comprehensive description of the implementation of the Independent Curriculum and PMM in vocational education contexts.

Result and Discussion

SMK Negeri 6 Padang as part of the Tourism Excellence Program in Padang City has integrated the use of the Independent Teaching Platform (PMM) in the implementation of the Independent Curriculum, especially in general group subjects. One of the main features used is Self-Training, which provides space for teachers to develop their competencies through self-exploration of training materials, video tutorials, webinars, and collaboration with peers. Training information sources are obtained from the official website of the Ministry of Education, Culture, Research, and Technology, social media, YouTube, and internal school training. This feature offers a variety of structured learning topics through the "For You", "Topics", and "Real Action" pages to support the effective implementation of the Independent Curriculum (Rahmadani & Kamaluddin, 2023).

In addition, the use of the Community feature also makes a significant contribution. Teachers join a learning community that allows for experiential exchange, emotional and professional support, and improved learning planning, technology use, classroom management, and assessment skills. This community facilitates the creation of active learning that is relevant to the needs of the world of work. However, the Principal Election feature in PMM has not been utilized optimally. Nevertheless, the principal gives a strong encouragement to teachers to participate in programs such as Guru Penggerak which is considered a strategic step in forming innovative and collaborative leadership cadres in the future.

In terms of teaching, the Student Assessment feature in PMM is actually very potential but cannot be used because it is still under development. Alternatively, teachers use other platforms such as Quizizz, Google Form, and Mentimeter to identify students' strengths and weaknesses more flexibly. The Learning Tools feature also shows limitations in the availability of content, especially for certain subjects, but can still be used by teachers who teach subjects that are already available in PMM. Meanwhile, the Learning Outcomes (CP) feature has provided inspiration by providing examples of Learning Goal Flows (ATPs) although its implementation in schools still requires additional workshops and training to optimize its use. The Classroom feature in PMM still cannot be used optimally due to its manual operation, making it difficult to track the progress of individual students.

The use of various PMM features at SMKN 6 Padang is designed to support the development of teacher competencies and performance. One of them is the "Self-Training" feature, which is used to improve teacher competence through topic-based training, videos, and real-world actions. However, access to these materials is still highly dependent on teachers' initiatives and the availability of internet networks. In addition, teachers are also involved in learning communities to share good practices and gain professional support, although not all teachers actively participate in these communities.

The "Principal Election" feature has not been used directly, but the principal has encouraged teachers to participate in the Driving Teacher Program. This feature has not been optimally accessed because it is limited to certain selections.

Meanwhile, "Competency Reflection" is used by teachers to conduct independent evaluation of learning strategies and media used. However, this reflection is still done manually and has not been integrated with the digital system.

Likewise with "Performance Management", which is used as the basis for the preparation of SKP and

monitored through the observation of school principals, but its implementation still focuses on administrative aspects.

The "Student Assessment" feature is still in the development stage and has not been fully utilized. Therefore, teachers use other applications such as Google Form and Quizizz for assessment purposes. In addition, "Learning Tools" is used to search for reference lesson plans and learning modules, although the content available is not yet complete for all subjects.

Meanwhile, "Learning Outcomes (CP)" is used as a reference in compiling Learning Objectives Flow (ATP), although teachers still need further training to prepare CP-based ATPs more effectively.

The "Class" feature has not been utilized to the fullest because the student tracking system is still done manually, considering that this feature is not fully integrated. On the other hand, the "Inspiration" feature makes use of motivational videos to improve the quality of learning, although not all content can be applied appropriately in the context of schools.

The "Portfolio" feature is used to document teachers' work and achievements, but unfortunately this feature cannot be used to document students' work.

The Use of Self-Development Features in the Implementation of the Independent Curriculum for the Use of PMM in General Group Subjects at the Vocational School at SMK 6 Padang

Teachers at SMKN 6 Padang have taken advantage of the self-training feature in the PMM application to improve their competencies, such as accessing the Exploration Platform, taking video tutorials, participating in webinars, and collaborating with peers. This training feature provides a wide range of relevant topics and is designed to be applied in the Independent Curriculum at every level of education. The app has three main pages, namely "For You", "Topics", and "Real Action", which allows teachers to monitor the progress of the training and follow the webinars according to their needs.

In addition, teachers at SMKN 6 Padang also join the learning community to share experiences, support each other in facing learning difficulties, and encourage innovation and collaboration. This community has a positive impact, such as improved learning planning, technology use, classroom management, and assessment skills, which ultimately encourages the creation of more active and relevant learning to the world of work.

Although the principal selection feature has not been fully utilized, the principal continues to support teachers to take part in various trainings available in the

PMM application, including the driving teacher program. This support aims to develop innovative, creative, and collaborative teachers who can later become future school principal cadres.

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The use of Teaching Features in the Implementation of the Independent Curriculum on the use of PMM in General Group Subjects at the Vocational School of the Padang City Tourism Center of Excellence Program

The use of teaching features in the implementation of the Independent Curriculum in the use of PMM at SMK Negeri 6 Padang begins with the Student Assessment feature, which helps teachers collect information about student learning processes and outcomes. However, this feature cannot be used because it is still in the development stage, so teachers use other applications such as Quizziz and Google Form.

The Learning Tools feature is also important, but it is not yet fully accessible because it is still under development. Teachers can use the search feature to find suitable material for the available subjects.

The Learning Outcomes feature or CP has the potential to improve the quality of learning by helping teachers design varied and student-centered learning activities. Although this feature is still in the development stage, teachers at SMK Negeri 6 Padang have held workshops and training to overcome these challenges.

The Classroom feature in PMM is still difficult to use optimally because it is done manually, which makes it difficult to track students' progress in mastering the material.

The Use of Inspiration Features in the Implementation of the Independent Curriculum for the use of PMM in General Group Subjects at SMK Negeri 6 Padang

The use of inspiration features in the implementation of the Independent Curriculum for the use of PMM at SMK Negeri 6 Padang begins with an Inspirational Video, which serves to motivate teachers to continue to innovate in learning. Although this video

provides convenience, the challenges faced are the gap between the theory presented and the practice in the field, as well as the limitations of facilities and resources in schools. Nonetheless, inspirational videos can help teachers find solutions to address these issues. A portfolio is a collection of evidence that documents the work of teachers and principals to demonstrate skills and achievements in the field of education. This portfolio is useful not only for teachers, but also for performance evaluations, curriculum development, and reports to related parties. However, the proof of work stored in the PMM feature still does not facilitate the documentation of student work.

Practical Idea Exploration is a feature that assists teachers in presenting more interesting and relevant material for students. This feature provides a variety of activities that connect religious values with other subjects, as well as providing flexibility for teachers to adapt ideas to the characteristics of students and existing resources. Thus, this feature supports continuous professional development for teachers.

Conclusion

Based on the results of the research, SMK Negeri 6 Padang has utilized various features in the Independent Teaching Platform (PMM) to support the implementation of the Independent Curriculum, especially in general group subjects. The Self-Training feature has been used effectively to improve teacher competence through various training resources such as video tutorials, webinars, and collaboration with peers. In addition, the Community feature also has a positive impact by improving learning planning, technology use, and classroom management skills. Although the Principal Election feature has not been fully utilized, school principals still encourage teacher participation in programs such as Teacher Driving to form leadership cadres in the future. However, some features, such as Student Assessments and Learning Tools, are still limited in use because they are still in the development stage. On the other hand, the Learning Outcomes (CP) and Practical Idea Exploration features make a significant contribution to improving the quality of learning. While CP still requires further training for its optimal implementation, this feature has inspired teachers to design more effective Learning Objective Flows (ATPs). The Classroom feature still cannot be used optimally due to its manual operation, which makes it difficult to track individual student progress. However, inspirational videos and Portfolios serve as a source of motivation and documentation of teachers' work, although portfolios cannot currently be used to document students' work. Overall, despite some limitations, the use of PMM features at SMK Negeri 6 Padang has had a positive impact on teacher competency development and improvement of learning quality.

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Conceptualization, A. and R.; methodology, A.; formal analysis, A; investigation, A; resources, A.; data curation, A.; writing—preparation of original drafts, A.; Writing—review and editing, A, R, Z, F All authors have read and approved the published version of the manuscript.

Conflicts of Interest
No conflict interest.

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