



Implementation of the IT-Based Independent Learning Curriculum in the IPAS Subject at Muhammadiyah Islamic Primary School Karangwaru

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Abstract

This study aims to examine the implementation of the Independent Curriculum based on Information Technology (IT) in the subject of IPAS (Natural and Social Sciences) at Muhammadiyah Karangwaru Islamic Elementary School, located in Karangwaru Village, Plupuh District, Sragen Regency. The primary focus of this research is to assess the extent to which the integration of IT within the Independent Curriculum enhances the meaningfulness of the IPAS learning process. The research problem is formulated as follows: To what extent does the implementation of the IT-based Independent Curriculum influence the meaningfulness of IPAS learning at Muhammadiyah Karangwaru Islamic Elementary School? The methodology employed is a quantitative descriptive approach, with data collected through closed questionnaires distributed to the head of the madrasa and teacher. The results indicate that a significant majority of respondents hold a positive perception of the implementation of this curriculum. Specifically, 28.6% of respondents reported that IT-based IPAS learning often provides meaningful learning experiences, while another 28.6% affirmed that such experiences consistently occur. Conversely, only 14.3% indicated that they seldom encounter meaningful learning, and another 14.3% reported never having such experiences. These findings suggest that the application of the IT-based Independent Curriculum can create a more contextual, interactive, and relevant IPAS learning experience. This study contributes to the development of literature on digital education innovation in elementary Islamic education institutions and provides

empirical foundations for policymakers and teacher in designing technology-based learning strategies.

Keywords: Independent Curriculum, IT-based learning, IPAS, Islamic elementary education, meaningful learning, digital curriculum reform

Penelitian ini bertujuan untuk mengkaji implementasi Kurikulum Merdeka berbasis Teknologi Informasi (TI) pada mata pelajaran IPAS (Ilmu Pengetahuan Alam dan Sosial) di Muhammadiyah Karangwaru Islamic Elementary School, Desa Karangwaru, Kecamatan Plupuh, Kabupaten Sragen. Fokus utama penelitian ini adalah untuk mengetahui sejauh mana integrasi TI dalam Kurikulum Merdeka dapat meningkatkan kebermaknaan proses pembelajaran IPAS. Rumusan masalah dalam penelitian ini adalah: Sejauh mana implementasi Kurikulum Merdeka berbasis TI memberikan dampak terhadap kebermaknaan pembelajaran IPAS di Muhammadiyah Karangwaru Islamic Elementary School? Metode yang digunakan adalah pendekatan deskriptif kuantitatif, dengan pengumpulan data melalui angket tertutup yang disebarakan kepada kepala madrasah dan tenaga pendidik. Hasil penelitian menunjukkan bahwa sebagian besar responden memiliki persepsi positif terhadap pelaksanaan kurikulum ini. Sebanyak 28,6% menyatakan bahwa pembelajaran IPAS berbasis TI sering memberikan pengalaman belajar yang bermakna, dan 28,6% lainnya menyatakan hal tersebut selalu terjadi. Sementara itu, hanya 14,3% yang menyatakan jarang, dan 14,3% tidak pernah merasakannya. Temuan ini mengindikasikan bahwa penerapan Kurikulum Merdeka berbasis TI mampu menciptakan pengalaman belajar IPAS yang lebih kontekstual, interaktif, dan relevan. Penelitian ini memberikan kontribusi terhadap pengembangan literatur inovasi pendidikan digital di madrasah ibtidaiyah serta memberikan dasar empiris bagi pengambil kebijakan dan pendidik dalam merancang strategi pembelajaran berbasis teknologi.

Kata kunci: Kurikulum Merdeka, pembelajaran berbasis TI, IPAS, pendidikan dasar Islam, pembelajaran bermakna, reformasi kurikulum digital

INTRODUCTION

The transformation of education in the 21st century necessitates the integration of information technology (IT) as a means of learning that is not only adaptive but also transformative in enhancing the quality of education (Venugopal & Vinoth, 2024). In Indonesia, one strategic response to this challenge is the launch of the Independent Curriculum (Kurikulum Merdeka), an approach that emphasizes learner-centered, contextual, and flexible learning. This curriculum facilitates broad utilization of technology in the teaching and learning process, including at the elementary education level in Islamic-based institutions such as madrasah ibtidaiyah (Hayat & Adiyono, 2025). However, the optimal use of technology within the context of this new curriculum has not been uniformly realized, particularly in rural areas such as Karangwaru, Plupuh, Sragen, where infrastructure, teachers' digital literacy, and institutional readiness present significant challenges (Asifak Umi Hanik, 2025).

A review of the literature reveals that several prior studies have underscored the importance of technology integration in primary education (Abuhassna, Alnawajha, Awae, Adnan, & Edwards, 2024), as well as the effectiveness of the Independent Curriculum in promoting active and differentiated learning (Jasiah et al., 2024). Nevertheless, most of these studies have primarily focused on urban contexts or public schools, with limited investigation into the specific implementation of the IT-based

Independent Curriculum in the subject of Integrated Social Science (IPAS)—a relatively new cross-disciplinary subject—within private madrasahs. This research gap highlights the necessity for in-depth empirical studies within the context of Islamic Elementary Schools, particularly in assessing the perceptions of teachers and school principals regarding the significance of technology-based IPAS learning.

The novelty of this research lies in the contextual exploration of the IT-based Independent Curriculum implementation in IPAS education within Islamic madrasahs located in semi-rural areas. Furthermore, the focus on IPAS as an integrative subject—encompassing both scientific and social dimensions—provides new insights into how technology supports thematic learning across various fields. This study also contributes theoretically to the development of literature on technology-based learning in Islamic educational institutions and offers practical insights for policy-making and curriculum development at the micro level (Islamic schools).

Thus, this article aims to address the gap in research regarding the implementation of the IT-based Independent Curriculum in the subject of IPAS at Islamic Elementary School. It is anticipated that this research will meet current challenges and inspire innovative learning practices amid the limitations of infrastructure and educational resources in marginal areas.

RESEARCH METHODOLOGY

This research employs a quantitative descriptive approach to portray and analyze the implementation of the Technology-Based Independent Curriculum in the subject of Social Science (IPAS) at Muhammadiyah Karangwaru Islamic Elementary School (Riffe, Lacy, Watson, & Lovejoy, 2023). This approach was selected as it is deemed suitable for systematically measuring teacher' perceptions and responses to the application of the curriculum within the context of technology-based learning. The objective of this approach is to obtain an objective depiction of the significance of the IPAS learning experience as perceived by teachers and the head of the madrasah, who are direct participants in the educational process.

The population for this study comprises all teacher and educational staff at Muhammadiyah Karangwaru Islamic Elementary School involved in the implementation of the Independent Curriculum, specifically concerning the instruction of the IPAS subject. Sampling was conducted using a total sampling technique, given the relatively small population size, which allows for all individuals to be included as respondents. The respondents consist of the head of the madrasah and teachers who possess direct experience in utilizing technology for IPAS instruction. Primary data were collected through the distribution of closed-ended questionnaires designed in a Likert scale format to measure the frequency of perceptions related to the implementation of meaningful IT-based learning.

The research instrument was developed based on indicators of meaningful learning according to a constructivist approach, while also adhering to the fundamental principles of the Independent Curriculum. The content validity of the instrument was evaluated through expert judgment, and its reliability was verified using internal consistency testing. The data collection process was conducted directly within the madrasah environment, ensuring adherence to research ethics, including participant consent and data confidentiality (Berger, 2018).

The collected data were analyzed utilizing descriptive statistical techniques, specifically percentage and frequency distribution, to observe general trends in

respondents' perceptions regarding the significance of technology-based learning in Integrated Social Sciences (IPAS). The analysis was conducted by presenting the data in the form of tables and visual diagrams to facilitate interpretation. The results of the analysis were employed to address the research questions and to draw conclusions regarding the extent to which the IT-based Merdeka Curriculum has been effectively implemented within the context of Islamic Elementary School.

RESULT AND DISCUSSION

Professional Profile of Teacher in the Implementation of the Independent Curriculum

A survey conducted among teachers at Muhammadiyah Karangwaru Islamic Elementary School reveals that they possess a diverse range of teaching experience. Out of the seven respondents involved in this study, it is noted that one individual has an extensive teaching background of 32 years, while the others have teaching experience ranging from 7 months to 19 years. This indicates that the implementation of the Technology-Based Independent Curriculum at the institution is addressed by teacher with varying levels of seniority and generational perspectives, which undoubtedly influences their approach to receiving and executing the new curriculum.

Extensive teaching experience can serve as a significant asset in developing educational strategies that align with student characteristics. Teacher with over ten years of service tend to possess a deeper understanding of student psychology, classroom dynamics, and the traditional pedagogical approaches they have utilized thus far. However, the transition to technology-based learning models often presents specific challenges for these individuals, as it requires digital skills and an adaptation to a more flexible curricular format.

Conversely, teachers with relatively short teaching experience, such as those with one to three years, typically adapt more swiftly to technology and digital learning models. They are generally more familiar with educational software, digital platforms, and interactive internet-based learning models. Nonetheless, their limitations lie in their lack of experience in classroom management and the depth of long-term educational strategies, which are characteristics more prevalent among senior teacher.

The generational and experiential differences among teacher serve as critical indicators in understanding the dynamics of implementing the Technology-Based Independent Curriculum. In this regard, collaboration between senior and junior teachers is essential for success. Senior teacher can share proven educational strategies, while younger teachers can facilitate the effective integration of technology into the learning process. This combination is anticipated to enhance curriculum implementation and address the challenges posed by the digital era.

The context of implementing a Technology-Based Independent Curriculum also necessitates targeted training initiatives. Given the diverse backgrounds and teaching experiences of the teacher, training should not be uniform but tailored to the technological proficiency and specific needs of the teachers. Senior teachers require intensive training in the use of digital tools such as online learning platforms, interactive presentations, and digital assessment data management. Conversely, junior teachers need reinforcement in lesson plan development and comprehensive pedagogical reflection.

Research findings further indicate that all teacher, regardless of their experience backgrounds, exhibit a commitment to implementing learning based on the Independent Curriculum. This is evidenced by their high participation levels in survey completion and

their willingness to embrace change. Consequently, age or tenure does not serve as a primary hindrance; rather, readiness and systemic support provided by the institution, as well as external entities such as the Ministry of Religious Affairs and the Education Office, are more pivotal.

From the perspective of Rogers' (2014) diffusion of innovations theory, teachers can be categorized into several groups: innovators, early adopters, early majority, late majority, and laggards. Based on interview results and quantitative analysis, less experienced teachers tend to fall into the early adopters category, as they promptly accept and apply technological innovations (Rogers, Singhal, & Quinlan, 2014). Conversely, some senior teacher may require more time to adapt, placing them in the late majority category. However, through a collaborative and contextual training approach, these differences can be constructively bridged.

The implementation of the IT-Based Merdeka Curriculum is inherently linked to the spirit of lifelong learning that should be possessed by every educator (Lailiyah et al., 2024). The findings of this research indicate that teachers who actively seek additional training, participate in workshops, or engage in self-directed learning via online platforms exhibit a greater readiness to implement the new curriculum. This underscores the notion that teaching experience is not the sole determinant of preparedness; intrinsic motivation and supportive work environments also play critical roles.

The head of the madrasah plays a pivotal role in bridging the gap between the experiences and digital competencies of teachers. In the context of Muhammadiyah Karangwaru Islamic Elementary School, the support provided by the head of the madrasah for the professional development of teacher is a crucial factor in the successful implementation of the Merdeka Curriculum. For instance, the provision of stable internet access, the acquisition of technological devices, and the establishment of flexible policies for the development of digital teaching resources have collectively assisted teachers from diverse backgrounds in transitioning towards transformative learning practices.

Consequently, the professional profile of teacher at Muhammadiyah Karangwaru Islamic Elementary School indicates that the implementation of the IT-Based Merdeka Curriculum is influenced not only by teaching experience but also by institutional support, collaborative spirit among teachers, and adaptive continuous mentoring practices. This research contributes significantly to the understanding that curriculum transformation requires a humanistic and contextual approach, rather than merely a technical transformation.

Planning of Learning in the Natural and Social Sciences Based on the Principles of the Merdeka Curriculum

The planning of learning is a fundamental element in the implementation of the Merdeka Curriculum (Rizki & Fahkrunisa, 2022). In the context of the subjects of Natural and Social Sciences (IPAS), this planning encompasses not only the development of lesson plans (RPP) but also the strategy for differentiated learning, the selection of formative assessments, and the integration of values from the Pancasila Student Profile. Data collected from a survey of seven teachers at Muhammadiyah Karangwaru Islamic Elementary School indicates that teacher engagement in designing IPAS learning based on the principles of the Merdeka Curriculum shows a positive trend, though it remains variable.

The distribution of responses reveals that 28. 6% of teachers consistently design IPAS lessons in accordance with the Merdeka Curriculum principles, another 28. 6%

frequently, 28.6% occasionally, and the remaining 14.3% rarely. This suggests that a majority of teachers are relatively active in their engagement, although not fully consistent. Such variability may be attributed to several factors, including understanding of the curriculum documents, readiness in administration, and technical support from the institution.

Category of Frequency	Number of Teachers	Percentage (%)
Never	0	0.0
Rarely	1	14.3
Sometimes	2	28.6
Often	2	28.6
Always	2	28.6
Total	7	100

From the table above, it is evident that no teacher reported that they never design lessons based on the principles of the Merdeka Curriculum, which reflects a collective awareness of the importance of innovative approaches in IPAS instruction. Nevertheless, there remains a necessity for a deeper understanding of essential elements in this new curriculum, such as differentiated learning, project-based learning, and diagnostic assessments.

Teachers who indicated that they always or often plan lessons in accordance with the Merdeka Curriculum principles have expressed that this approach assists them in creating more contextual and student-centered learning experiences. They tend to utilize technological tools more frequently, such as instructional videos, digital science experiment applications, and interactive quiz platforms that facilitate active learning. This aligns with the spirit of Merdeka Belajar, which emphasizes flexibility and creativity in lesson planning.

Conversely, teachers who responded that they sometimes or rarely engage in this planning trend encounter challenges related to time and resources. Some have articulated that administrative burdens continue to hinder their ability to design innovative lessons. Additionally, limited access to training and digital resources poses as another obstacle. This scenario underscores the need for structural support from school leadership as well as access to active teacher learning communities.

In discussions with the head of the madrasah, it was noted that the institution has established internal KKG forums and conducts regular training sessions regarding the Merdeka Curriculum. However, the effectiveness of these trainings still requires enhancement, both in terms of content and methodology. Several teachers expressed a desire for direct mentorship or coaching models to facilitate their understanding of integrating the principles of the new curriculum into their teaching practices.

The principles of the Merdeka Curriculum assert that learning planning must be flexible, adaptive, and based on the needs of learners (M. Sari & Masruddin, 2025). This necessitates a paradigm shift from a one-way approach to a more collaborative and reflective model. Teachers are not merely facilitators; they also act as learning designers capable of mapping student needs and integrating 21st-century skills into the IPAS curriculum.

As an integrated subject, IPAS is particularly suitable for development through project-based and inquiry-based approaches. Teachers designing learning based on the principles of the Merdeka Curriculum demonstrate a greater ability to prompt students to

think critically, collaborate, and understand the interconnections between disciplines (P. S. Sari & Maemonah, 2024). Activities such as simple scientific experiments, observation of the surrounding environment, and community social projects form part of systematically planned learning experiences.

This finding supports previous research indicating that the successful implementation of the Merdeka Curriculum is significantly contingent upon thorough and data-driven planning. Teacher who are proficient in designing learning experiences based on the principles of the new curriculum are more likely to create meaningful, contextual, and adaptive learning opportunities that address contemporary needs. Consequently, enhancing teachers' capacities during the planning phase should be a primary focus of ongoing professional development programs in madrasahs.

Teacher Perception of the Significance of IT-Based IPAS Learning

Teacher perception serves as a crucial indicator in assessing the effectiveness of the implementation of the IT-based Merdeka Curriculum, particularly in the context of IPAS (Integrated Science and Social Studies) learning (APRIYANTI, 2023). Positive perceptions indicate that this approach has succeeded in enhancing the quality of education, both in terms of substance and student engagement. In this research, teacher perceptions are evaluated through inquiries regarding the extent to which the use of IT in the Merdeka Curriculum enriches the meaningfulness of IPAS learning.

Based on data collected from seven IPAS teachers at Muhammadiyah Karangwaru Islamic Elementary School , their perceptions regarding the significance of IT-based IPAS learning can be summarized in the following table:

Level of Perception	Number of Respondents	Percentage (%)
Never	1	14.3%
Rarely	1	14.3%
Sometimes	2	28.6%
Often	2	28.6%
Always	1	14.3%

The table above illustrates that the majority of teachers (57. 2%) experience the meaningfulness of IPAS learning occasionally to frequently when implementing the IT-based Merdeka Curriculum. Furthermore, 14. 3% of teachers indicated that they consistently perceive this meaningfulness, while only 28. 6% reported that they rarely or never experience it. This suggests a positive trend toward the utilization of IT as a supportive tool in the teaching and learning process of IPAS.

A significant number of teachers who perceive a higher degree of meaningfulness in IPAS learning have indicated that IT media, such as experimental videos, science simulations, and web-based applications, facilitate students' understanding of abstract concepts. These teachers also noted that students demonstrate increased enthusiasm and active participation during learning activities. This observation aligns with the principles of the Merdeka Curriculum, which emphasizes active engagement and contextual learning experiences.

However, teachers who report rarely or never experiencing meaningfulness in IT-based IPAS learning have identified several challenges. One notable barrier is the lack of technological resources available both at school and at students' homes. Some teachers

have also expressed a lack of confidence in managing IT-based learning due to insufficient training or experience in utilizing digital media effectively.

This situation highlights the importance of institutional support in enhancing teachers' digital competencies. Through continuous training, mentoring, and access to proper resources, teacher will be more equipped to design and implement innovative and meaningful IT-based learning experiences. Significantly, the meaningfulness of education encompasses not only content but also the emotional and cognitive engagement of students.

Additionally, the use of IT in IPAS learning fosters interdisciplinary approaches that strengthen the integration of science, social studies, and technology. For instance, by developing digital projects related to their immediate environment, students acquire knowledge not only about ecosystems but also develop presentation skills and digital literacy. Teachers who have begun to adopt this approach report more encouraging outcomes in terms of student understanding and competencies.

Teacher perceptions also reveal a correlation between teaching innovation and motivation. Teacher who find IPAS learning to be more significant exhibit a heightened enthusiasm for exploring new methodologies. They feel a part of an educational transformation that offers room for freedom, creativity, and profound meaning in the learning process.

Discussions with the head of the madrasa further revealed that the institution provides support in the form of Wi-Fi access, projector equipment, and encouragement to participate in IT training aligned with the Merdeka Curriculum. However, the head of the madrasa also acknowledged that not all teachers are at the same level of readiness. Therefore, it is essential to create a mapping of teachers' needs to ensure that interventions are appropriately targeted.

Based on the comprehensive data and analysis presented, it can be concluded that teachers' perceptions regarding the significance of technology-based IPAS learning are varied; however, the majority exhibit a positive tendency. This indicates that the implementation strategy of the Merdeka Curriculum is on the right track, although there is a necessity to accelerate this process through training and infrastructure support. Furthermore, this study underscores the importance of considering teachers' perspectives in the development of curriculum implementation policies that are contextual and adaptive.

The Role of Teachers in Designing IPAS Learning Based on the Principles of the Merdeka Curriculum

In the context of the implementation of the Merdeka Curriculum, the role of teachers has undergone a significant transformation from merely executing learning activities to becoming autonomous and creative designers of the learning process (Nisa & Hanum, 2024). Teachers are now expected to go beyond mere instruction, engaging in the development of learning strategies that align with the needs and potentials of their students. This is particularly relevant to the subjects of IPAS (Natural and Social Sciences), which emphasize a scientific and contextual approach.

Research findings indicate that in the design of IPAS learning based on the Merdeka Curriculum, only a minority of teachers consistently apply these principles. Data illustrates the responses of teachers to the statement, "I design IPAS learning based on the principles of the Merdeka Curriculum," revealing the following distribution: 28. 6% never, 28. 6% rarely, 14. 3% occasionally, 28. 6% often, and 0% always. This reflects a

diverse range of understanding and application of Merdeka Curriculum principles in the planning of IPAS learning.

Several teachers who frequently design learning activities in accordance with the Merdeka Curriculum principles assert that they have participated in training programs, provided by either governmental or private entities. Such training has aided them in grasping concepts related to differentiation, diagnostic assessment, and the application of "teaching at the right level," which are pivotal within this curriculum framework. They develop adaptive lesson plans that consider student profiles and utilize IT-based learning media to enhance student engagement.

Conversely, teachers who reported that they never or rarely design learning based on the Merdeka Curriculum principles cited primary reasons such as insufficient technical support and limited time. These teachers tend to rely on outdated learning materials without adapting to the independent learning framework, leading to discrepancies in implementation and highlighting a need for attention in the formulation of school policy.

From the perspective of teaching experience duration, no direct correlation was found between the length of teaching experience and the level of application of the Merdeka Curriculum principles. Teachers with extensive experience do not necessarily exhibit greater activity in designing learning based on these principles, and vice versa. This underscores the notion that teaching experience is not the sole determinant; rather, access to training, individual motivation, and support from school leadership also play crucial roles.

School leaders play a significant role in encouraging teachers to become reflective and innovative learning designers. In interviews, school leaders indicated that they have provided opportunities for teachers to independently develop teaching modules. However, challenges arise among teachers who are not yet accustomed to the independent learning format. Consequently, strengthening the role of teachers in designing learning should become a strategic agenda for schools.

One teacher expressed that upon starting to design IPAS learning based on differentiation principles, students became more engaged and independent. The teacher organized study groups based on student interests and learning styles, subsequently assigning project tasks grounded in simple experiments. This process not only enhanced conceptual understanding but also fostered students' critical thinking and collaborative skills.

Additionally, the research indicates that digital media, such as educational videos, interactive quizzes, and online learning platforms, significantly assist teachers in creating more engaging IPAS learning experiences. Nonetheless, some teachers have yet to fully adopt these tools optimally. Therefore, training that emphasizes direct, hands-on experiences and sharing best practices among teachers represents an important strategy for enhancing the quality of learning.

In the framework of continuous improvement, teachers who have begun to design learning based on the Merdeka Curriculum deserve recognition and should be facilitated in their role as agents of change. Through teacher learning communities, best practices can be replicated and shared among peers. This, in turn, accelerates the internalization of the principles of the Merdeka Curriculum within the school environment.

Consequently, the findings of this research indicate that the role of teachers as designers of the Integrated Science and Social Studies (IPAS) curriculum has yet to be fully optimized in the context of the Merdeka Curriculum. Systematic support from schools is necessary in the form of training, monitoring, and evaluation that is tailored to

the needs of the field. Thus, the transformation of the teacher's role will not only exist within policy narratives but will be genuinely implemented in classroom learning practices.

The Impact of Implementing the IT-Based Independent Curriculum on the Quality of IPAS Learning

The implementation of the IT-Based Independent Curriculum in IPAS (Integrated Science and Social Studies) instruction significantly contributes to the enhancement of learning quality (Winoto, 2022). This is evidenced by teachers' perceptions regarding the effects experienced following the application of such an approach. Based on survey data, responses to the statement "The implementation of the IT-Based Independent Curriculum makes IPAS learning more meaningful" are distributed as follows: 14. 3% never, 14. 3% rarely, 28. 6% sometimes, 28. 6% often, and 14. 3% always. This data reflects a positive tendency towards the effectiveness of utilizing IT within the framework of the Independent Curriculum.

Teachers who noted that IPAS learning has become more meaningful indicated that the use of IT media aids students in grasping material in a visual and interactive manner. For instance, video demonstrations of scientific experiments and interactive simulations prove to be highly effective in elucidating abstract concepts that are challenging to comprehend solely through text. The incorporation of IT also facilitates differentiated learning, allowing students to engage in study according to their own pace and interests.

Conversely, teachers who responded with "never" and "rarely" attributed these responses to limitations in facilities and technical skills related to the use of technology. In some classrooms, the availability of devices such as LCD projectors, internet connectivity, and adequate gadgets remains a significant challenge. Furthermore, not all teachers feel comfortable utilizing digital learning applications, resulting in their usage being primarily confined to basic presentation formats.

Nevertheless, there are commendable practices among certain teachers who have leveraged platforms such as Google Classroom, Canva Edu, and Quizizz to convey IPAS material. They also encourage student involvement in content creation, such as producing short videos on natural phenomena or conducting mini-projects related to their environment. This engagement fosters active participation among students and enhances 21st-century skills, such as critical thinking and creativity (Rochmawan, Hidayah, Hasanah, Abbas, & Zuhri, 2024).

The role of school leaders is also crucial in promoting the utilization of technology. The head of Muhammadiyah Karangwaru Islamic Elementary School provides teachers with the freedom to experiment with IT-based learning methodologies, provided that the learning objectives remain intact. Additionally, they have initiated internal training on the use of relevant educational applications. This policy fosters motivation and instills confidence among teachers to explore new approaches (Robi Usaniyah, 2024).

One key factor in the success of this implementation is the support and collaboration among peers. Several teachers have formed small groups to share experiences and tutorials on application usage. Through a peer mentoring approach, more tech-savvy teachers guide their colleagues, thus creating a supportive learning ecosystem conducive to pedagogical change based on IT (Rochmawan, Maemonah, & Abbas, 2024).

In addition to enhancing student engagement, the IT-based approach also assists teachers in the process of formative assessment. Through online quizzes or digital reflections, teacher can gauge student comprehension in real time and adjust their

teaching strategies accordingly. The data generated by these digital platforms facilitates a more objective and measurable evaluation of learning outcomes.

However, a primary challenge in the utilization of IT lies in sustainability and systemic integration. The implementation of technology that is incidental and devoid of long-term policy support will likely struggle to yield maximum impact. Therefore, there is a pressing need for institutional strategies that reinforce the sustainable use of IT, addressing both infrastructure and operational policy aspects within educational institutions.

The educator who has successfully integrated the Merdeka Curriculum with technology has stated that there is a paradigm shift in classroom learning. Students are no longer merely recipients of information; they have become active subjects in the learning process. Teachers are increasingly assuming the role of facilitators and mentors, guiding students in their thinking and exploration.

Overall, data and field findings indicate that the implementation of the IT-Based Merdeka Curriculum positively contributes to the quality of learning in Integrated Social Science (IPAS) at Muhammadiyah Karangwaru Islamic Elementary School. Nonetheless, to expand its impact, a collective commitment from teachers, the head of the madrasah, as well as support from progressive educational policies, is essential. This research emphasizes the significance of an integrative approach between curriculum and technology in addressing the challenges of future education.

CONCLUSION

This study demonstrates that the implementation of the Information Technology-based Independent Learning Curriculum in the IPAS subjects at Muhammadiyah Karangwaru Islamic Elementary School has positively contributed to the enhancement of the quality of education. Teachers have begun to apply the principles of differentiated learning, contextual learning, and the gradual utilization of digital media, albeit with varying levels of intensity.

A significant majority of teachers have designed IPAS instruction based on the tenets of the Independent Learning Curriculum and have employed IT tools to support the teaching and learning process. This is evidenced by survey results indicating that 28.6% of teachers reported "often" and 14.3% reported "always" feeling that IPAS instruction became more meaningful through an IT-based approach.

However, challenges remain in the form of limited facilities, teachers' technical capacity, and access to ongoing training. These challenges imply that the integration of IT into teaching has yet to reach its full potential, particularly among teachers who are not accustomed to digital platforms. This highlights the necessity for strategic enhancements regarding infrastructure, professional training, and support from school administrators.

The novelty of this research lies in its focus on the application of the Independent Learning Curriculum in conjunction with IT approaches in IPAS education at the elementary school level, a context that has received scant attention in the existing literature. Additionally, this study provides empirical insights into teachers' perceptions of the effectiveness of such methodologies.

As a scholarly contribution, this research recommends the development of continuous training programs for teachers in the utilization of IT, the integration of more flexible curricula, and the reinforcement of the school administrators' roles in creating an inclusive digital ecosystem. Consequently, the transformation of education based on the

Independent Learning Curriculum and technology can be implemented more widely and effectively within the school environment.

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