EDUCATIONAL REVOLUTION IN THE DIGITAL ERA: INTEGRATING TECHNOLOGY IN THE INDEPENDENT CURRICULUM

Ibnu Chudzaifah[1], Afroh Nailil Hikmah [2]
[1]Universitas Islam Negeri Sunan Kalijaga Yogyakarta, Yogyakarta, Indonesia
[2]Universitas Negeri Yogyakarta, Yogyakarta, Indonesia

Abstract

Technology, including education, has become an integral part of life in this digital era. Technological developments bring new challenges and opportunities that change the traditional learning paradigm. The concept of Independent Learning in Indonesia, which focuses on student participation and autonomy, is increasingly relevant with technology support. This research uses qualitative methods that focus on literature reviews. Information was collected by analyzing articles, journals, and books discussing the use of technology in the Independent Curriculum. Research shows that the use of technology in education has a significant impact on student achievement, skills, and engagement. The integration of technology in the Independent Curriculum not only enriches learning content but also supports the achievement of the Pancasila Student profile. However, challenges such as gaps in technology access and teacher training must be addressed. With the right approach, technology can be a powerful tool for improving the quality of education and preparing students for an increasingly digital future.

Corresponding Author:
Ibnu Chudzaifah
Universitas Islam Negeri Sunan Kalijaga Yogyakarta, Yogyakarta, Indonesia
Jalan Laksda Adisucipto, Papringan, Caturtunggal, Kec. Depok, Sleman Regency, Yogyakarta Special Region 55281
ibnuchudzaifah@iainsorong.ac.id

INTRODUCTION

In this digital era, technology has become an inseparable part of everyday life, including in the field of education. The ever-growing digital era brings new challenges and opportunities in the world of education (Surachman et al., 2024). Students now live in the midst of a technological

revolution with easy access to various sources of information. Traditional skills alone are no longer enough to achieve success, they also need to be able to adapt to rapid technological changes and have the ability to continue learning throughout life (Liriwati, 2023).

In this context, the concept of Merdeka Belajar emerges as an educational alternative that places students as the main center in the learning process. Merdeka Belajar emphasizes the values of participation and autonomy, giving students the freedom to actively determine their way of learning according to their individual interests and needs (Rambung et al., 2023). In Indonesia, the application of technology in education is increasingly accelerated with the Independent Curriculum which gives schools and teachers greater freedom to adapt teaching methods according to student needs.

Research results show that the use of technology in learning has a significant impact on student achievement and skills (Rusmana, 2020; Panjaitan et al., 2020). Other research results also support the importance of technology integration in education. Research shows that the use of technology in learning can increase student engagement (Hidayat & Khotimah, 2019), improve learning outcomes (Rusmana, 2020), improve skills (Panjaitan et al., 2020), and digital technology integrated into constructivist-based education can help improve the quality and efficiency of education (Lathifah, 2024).

From the results of this research, technology has great potential to revolutionize education by providing wider access to information, enabling more interactive and personalized learning, and equipping students with digital skills that are important for their future. While there are challenges to overcome, such as the availability of technology and teacher training, the benefits offered by technology in education are far greater. Therefore, efforts to integrate technology in the Independent Curriculum must continue to be encouraged and supported by all interested parties. The purpose of this article is to explore how technology can be integrated in the Merdeka Curriculum to create a learning environment that is more effective, interactive, and relevant to the needs of the times. Researchers are trying to explore more deeply the various benefits that can be obtained from the use of technology in education, especially in the context of an independent curriculum.

METHOD

This research uses qualitative methods that focus on literature reviews. Information was collected through in-depth analysis of articles, journals and books that discuss the use of technology in the Independent Curriculum. This approach allows researchers to explore multiple perspectives and findings from existing literature, providing comprehensive insight into the research topic.

The data collection process involves several systematic stages. First, researchers conducted a search for relevant literature using related keywords, such as "technology in education," "Independent Curriculum," and "Independent Learning." After relevant literature is found, the researcher reads and records data related to the research topic. This data was then verified to ensure its accuracy and relevance to the research objectives.

Next, the researcher identified and classified the data based on themes and categories that emerged from the literature analysis. For example, data can be classified based on the benefits of technology in education, the challenges faced, and the impact of technology integration on achieving the Pancasila Student profile. This identification and classification process was carried out carefully to ensure that all relevant aspects were covered and analyzed in depth.

The analytical method used in this research is content analysis techniques. This technique involves several key activities, including reading the literature thoroughly, recording important data, verifying the validity of the data, identifying main themes, classifying the data into appropriate categories, discussing findings with the research team or colleagues, presenting the data in a suitable format. clear and structured, and concludes the research results based on the analysis that has been carried out.

Content analysis allows researchers to identify patterns and relationships in the data, providing a deeper understanding of how technology can be integrated in the Merdeka Curriculum to improve the quality of learning. It is hoped that the results of this research can make a significant contribution to the development of more effective and relevant education strategies in the digital era, as well as assist stakeholders in designing education policies that are inclusive and globally competitive.

Using a qualitative approach and content analysis techniques, this research aims to explore the various benefits and challenges of technology integration in the Independent Curriculum, as well as provide practical recommendations for its implementation in the field. It is hoped that this will help in creating a learning environment that is more interactive, adaptive, and in line with students' needs in the digital era.

RESULTS AND DISCUSSION
Digital Era and Education

Digital transformation has changed the way we learn, teach and interact in educational contexts (Waliulu et al., 2023). Advances in information and communications technology (ICT) have opened the door to new possibilities in learning, enabling access to large amounts of information quickly and efficiently.

In the educational context, technology has brought significant changes (Purba & Saragih, 2023). The use of technology has become

increasingly important to prepare the younger generation to face the demands of an increasingly complex future (Alvendri et al., 2023). Schools throughout the world, including in Indonesia, have begun to adopt technology as an integral learning tool (Budiharto et al., 2019). From the use of interactive learning software to online learning platforms, technology-based approaches have opened up new opportunities for delivering material, facilitating discussions, and evaluating student progress. Now, students have immediate access to global learning resources with just a few clicks, transforming the traditional paradigm of teacher-centered learning into a more open and collaborative experience. Teachers have also taken on new roles as learning facilitators, using technology to enrich students' learning experiences and create responsive and interactive learning environments (Yuniani et al., 2019).

However, gaps in access to technology are still a major challenge in education. Not all schools have equal access to technology, and there is a risk that the digital divide could exacerbate educational disparities (Meilinda et al., 2020). Many schools in remote or low-income areas still experience limitations in technological infrastructure and access to devices (Falah & Hadna, 2022). This results in inequalities in educational opportunities, where students from stronger economic backgrounds may have greater access to digital resources than their less fortunate peers (Nurdyansyah, 2017).

Therefore, it is important for all parties involved in education to understand the implications of this digital era and ensure that all students can utilize the full potential of technology in their learning process. Technology integration in education is not just about introducing new devices, but also about ensuring that all students have equal opportunities to utilize the potential of technology in improving their skills, understanding and creativity (Fitriyadi, 2013). Thus, a deep understanding of the relationship between the digital era and education is an important first step in building a sustainable and inclusive educational future.

Trends in Technology Use in Education
The use of technology in education has experienced exponential growth in recent years (Muzakir et al., 2023). Many schools and educational institutions around the world have adopted various types of technology to enhance students' learning experience. For example, the use of online learning platforms such as Moodle, Google Classroom, and Edmodo has become common in many schools, allowing teachers to deliver materials, assignments, and exams online.

In addition, mobile learning applications are also increasingly popular. This application offers access to various study materials, quizzes

and interactive learning resources that can be accessed anywhere and at any time (Aditia, 2021). This provides great flexibility for students to learn according to their own rhythm and learning style.

Technology has also enabled the development of innovative learning tools, such as virtual reality (VR) and augmented reality (AR). By using VR and AR, students can experience more immersive and in-depth learning, such as exploring historical locations or exploring three-dimensional chemical structures (Shabir, 2022). However, it is important to remember that the use of technology in education is not just about introducing new devices, but also about integrating technology into the curriculum in a meaningful and effective way. This requires careful planning, training for teachers, and ongoing support from schools and educational institutions.

However, it is important to remember that technology is just a tool, and its success in education depends largely on how it is used. Therefore, educators need to be trained to utilize technology effectively, and education policies must support equitable access to technology for all students, including those in remote or disadvantaged areas. In this way, technology can truly be a driver of positive change in education, preparing the younger generation to face challenges and seize opportunities in this digital era. With the right approach, technology can be a powerful tool to enhance learning and prepare students for an increasingly digital future.

Technology Integration in the Independent Curriculum

In the context of the Independent Curriculum, technology integration has a very important role in improving the quality of learning and preparing students to face challenges in the digital era (Liriwati, 2023). The Merdeka Curriculum gives schools and teachers greater freedom to adapt teaching methods according to student needs and local conditions. Especially in achieving the Pancasila Student profile, technology can contribute significantly (Rahmadayanti & Hartoyo, 2022).

Technology can help in achieving the Pancasila Student profile which includes six main characteristics: faith and devotion to God Almighty as well as noble character, global diversity, mutual cooperation, independence, critical reasoning and creativity (Kiska et al., 2023). Here's how technology can support each of these characteristics:

1) Have faith, be devoted to God Almighty, and have noble character
   Technology can provide access to various religious and moral learning resources, as well as applications that facilitate the learning of ethical and moral values.

2) Global Diversity
   Through technology, students can communicate and collaborate with

students from different countries, broadening their horizons about different cultures and perspectives. Online learning platforms and social media can be used for collaborative projects between countries.

3) Mutual Cooperation

Technology can be used to facilitate teamwork and collaboration on school projects. Digital collaboration tools such as Google Workspace or Microsoft Teams allow students to work together effectively even in different locations.

4) Independent

Digital learning resources allow students to learn independently at their own pace and learning style. Online learning platforms provide opportunities for students to explore further material beyond the standard curriculum.

5) Critical Reasoning

Technology can be used to access diverse information and teach students how to critically evaluate sources of that information. E-learning apps and platforms can provide interactive exercises that develop critical thinking skills.

6) Creative

Digital tools such as graphic design software, programming applications, and digital musical instruments can help students express their creativity. Technology allows students to create original content, from videos to mobile apps, that they can share with a wider audience.

The integration of technology in the Independent Curriculum also allows for a more flexible and adaptive approach to learning (Hakim & Abidin, 2024). Schools and teachers can use technology to develop dynamic curricula, utilize data to understand student needs and progress, and implement innovative and effective teaching strategies.

Overall, using technology wisely and strategically in the context of the Independent Curriculum can help create a learning environment that is more inclusive, adaptive and relevant to student needs in the digital era, while developing a holistic and globally competitive Pancasila Student profile.

In the Merdeka Curriculum, technology integration is not just about using hardware and software, but about creating a learning environment that utilizes technology to support the achievement of broader educational goals. The following are several aspects that need to be considered in developing technology integration in the Independent Curriculum:

1) Project Based Learning

The Merdeka Curriculum emphasizes student-centered and project-based learning, where students learn through active exploration and

application of concepts in real contexts (Alhayat et al., 2023). Technology can be used to support this type of learning by providing access to design, simulation, and engineering tools that allow students to create and explore their own projects.

2) Collaborative Learning

Technology integration in the Independent Curriculum also includes an emphasis on collaborative learning between students (Suweta, 2023). Online learning platforms and collaboration tools such as Google Workspace for Education or Microsoft Teams can be used to facilitate discussions, share ideas, and work together on group projects.

3) Enrichment of Learning Content

Technology can be used to enrich learning content in the Independent Curriculum (Handayani et al., 2023). For example, learning videos, interactive simulations, and learning applications can be used to present information in a way that is interesting and easy for students to understand.

4) Authentic Assessment

The Independent Curriculum emphasizes authentic and meaningful assessment, where students are assessed based on their performance in the context of real situations (Zebua & Zebua, 2024). Technology can be used to support this type of assessment by providing tools to create project-based assignments, digital portfolios, or multimedia presentations.

5) Teacher Training

It is important for teachers to receive adequate training in using technology to support learning under the Merdeka Curriculum (Winarsih et al., 2024). This training should include the use of specific technology tools, effective teaching strategies, and the integration of technology into lesson plans.

By paying attention to these aspects, the integration of technology in the Merdeka Curriculum can be a powerful means of improving the quality of learning, facilitating student-centered learning, and preparing students to become future leaders in the ever-evolving digital era.

Technological Challenges in the Independent Curriculum Era

Technological challenges in the Independent Curriculum era involve a number of aspects that need to be considered to ensure the integration of technology runs smoothly and effectively in the educational process. Here are some of the main challenges faced:

1) Access and Infrastructure Gaps

One of the main challenges in integrating technology in the Independent Curriculum is the gap in access and infrastructure

(Hasanbasri & Nurhayuni, 2023). Although digital technology offers great potential to improve learning, there are still many schools in rural or remote areas that do not have adequate access to technological infrastructure. This can take the form of a slow or unstable internet connection, a lack of hardware such as computers or tablets, and a lack of technology-enabled facilities, such as classrooms equipped with multimedia devices. Difficulty in overcoming these gaps can exacerbate educational disparities between urban and rural areas, as well as between different socio-economic groups.

2) Inadequate Teacher Training

Technology integration in the Independent Curriculum requires teachers who are skilled in the use of digital technology to support effective learning. However, many teachers have not received adequate training in this matter (Rivalina, 2014). Limited or inadequate training can hinder teachers' ability to utilize technology optimally in the learning process. Additionally, teachers may also face challenges in adapting their curriculum and teaching strategies to integrate digital technologies in effective and meaningful ways.

3) Privacy and Data Security Concerns

The use of digital technology in education also brings concerns about the privacy and security of student data (Mambu et al., 2023). As more and more information is collected through online learning platforms and educational applications, there needs to be special attention to the privacy of student data and protection against online security threats such as hacking or identity theft. These concerns can hinder the adoption of technology in education if not handled well by the parties involved.

4) Lack of Funds and Long-Term Plans

Technology integration in the Merdeka Curriculum requires significant investment in infrastructure, teacher training and digital content development (Mobonggi et al., 2023). However, there is often a lack of adequate funding or long-term plans for educational technology development. A lack of financial resources can hinder the progress of technology integration in education, especially in schools with budget constraints.

5) Challenges of Cultural and Curriculum Adaptation

The integration of technology in education can also face the challenges of cultural and curriculum adaptation (Hakim & Abidin, 2024). Established education systems may face obstacles in changing the teacher-centered learning paradigm to more interactive and project-based learning. Apart from that, technology integration also requires curriculum revision that is more dynamic and responsive to

technological developments and student needs. This process requires strong support and cooperation from various related parties, including teachers, schools, government and society.

6) Anxiety about Replacing Teacher Jobs by Technology

There are concerns that the use of technology in education could replace the role of teachers altogether, reducing human interaction which is important in the learning process (Mambu et al., 2023). However, a better approach is to view technology as an aid to teachers, not as a replacement for them. The role of teachers as facilitators, motivators and mentors remains very important in supporting students' holistic development, while technology can help enrich the learning experience.

To overcome this challenge, there needs to be cooperation between government, schools, communities and the private sector. Continuous investment in technological infrastructure, continuous teacher training, strict privacy policies, and the development of curricula that are adaptive and responsive to technology are key steps in addressing technological challenges in the Independent Curriculum era. With a holistic and collaborative approach, these challenges can be overcome to create a learning environment that is more inclusive, adaptive, and relevant to students' needs in this digital era.

The integration of technology in education, especially in the context of the Independent Curriculum, is an important step in preparing students to face the challenges and opportunities in the digital era. Technology provides wider and easier access to various sources of information, enabling more interactive, personalized and flexible learning. In addition, technology plays a significant role in supporting the achievement of the Pancasila Student profile, which includes the characteristics of faith, global diversity, mutual cooperation, independence, critical reasoning and creativity. The Merdeka Curriculum gives schools and teachers the freedom to adapt teaching methods according to student needs and local conditions, which can be strengthened by the integration of technology.

Technology can support project-based learning, collaborative learning, content enrichment, authentic assessment, and teacher training, all aimed at creating a more effective and relevant learning environment. However, to achieve the full potential of technology in education, challenges such as gaps in access to technology and teacher training needs must be addressed. All stakeholders in education need to work together to ensure that all students have equal opportunities to utilize technology to improve their skills, understanding and creativity.

Overall, the integration of technology in the Independent Curriculum can help create education that is more inclusive, adaptive

and responsive to student needs in the digital era. In this way, the young generation can be prepared to become future leaders who are competent, creative and globally competitive.

REFERENCE

Aditia, S. (2021). *Inovasi Pembelajaran Berbasis Aplikasi Mobile Pada Masa Pandemi Covid 19*.

Alhayat, A., Mukhidin, M., Utami, T., & Yustikarini, R. (2023). The Relevance of the Project-Based Learning (PjBL) Learning Model with "Kurikulum Merdeka Belajar." *DWIJA CENDEKIA: Jurnal Riset Pedagogik*, 7(1).

Alvendri, D., Giatman, M., & Ernawati, E. (2023). Transformasi Pendidikan Kejuruan: Mengintegrasikan Teknologi IoT ke dalam Kurikulum Masa Depan. *Journal of Education Research*, 4(2), 752–758.

Budiharto, B., Triyono, T., & Suparman, S. (2019). Pengaruh Teknologi Pendidikan Pada Era Revolusi Industri 4, 0. *SEUNEUBOK LADA: Jurnal Ilmu-Ilmu Sejarah, Sosial, Budaya Dan Kependidikan*, 6(2), 96–144.

Falah, A. I., & Hadna, A. H. (2022). Problematika Pendidikan Masa Pandemi di Indonesia pada Daerah 3-T (Terluar, Tertinggal, dan Terdepan). *Jurnal Pendidikan Dan Kebudayaan*, 7(2), 164–185.

Fitriyadi, H. (2013). Integrasi teknologi informasi komunikasi dalam pendidikan: potensi manfaat, masyarakat berbasis pengetahuan, pendidikan nilai, strategi implementasi dan pengembangan profesional. *Jurnal Pendidikan Teknologi Dan Kejuruan*, 21(3).

Hakim, M. N., & Abidin, A. A. (2024). Platform Merdeka Mengajar: Integrasi Teknologi dalam Pendidikan Vokasi dan Pengembangan Guru. *Kharisma: Jurnal Administrasi Dan Manajemen Pendidikan*, 3(1), 68–82.

Handayani, F., Hasyim, D. M., Suryono, W., Sutrisno, S., & Novita, R. (2023). Peran Teknologi Pendidikan Dalam Mendukung Efektivitas Pelaksanaan Kurikulum Merdeka Belajar Di Perguruan Tinggi. *Jurnal Review Pendidikan Dan Pengajaran (JRPP)*, 6(4), 1265–1271.

Hasanbasri, H., & Nurhayuni, N. (2023). Sumber Daya Teknologi Terhadap Pelaksanaan Kurikulum di Era Digital. *AL-MIKRAJ Jurnal Studi Islam Dan Humaniora (E-ISSN 2745-4584)*, 4(1), 874–888.

Hidayat, N., & Khotimah, H. (2019). Pemanfaatan teknologi digital dalam kegiatan pembelajaran. *Jurnal Pendidikan Dan Pengajaran Guru Sekolah Dasar (JPPGuseda)*, 2(1), 10–15.

Kiska, N. D., Putri, C. R., Joydiana, M., Oktarizka, D. A., Maharani, S., & Destrinelli, D. (2023). Peran profil pelajar pancasila untuk membentuk

karakter peserta didik sekolah dasar. *Journal on Education*, *5*(2), 4179–4188.

Lathifah, A. S. (2024). Pemanfaatan Teknologi Digital dalam Pembelajaran Konstruktivisme: Meningkatkan Kualitas Pendidikan di Era Digital. *Jurnal Pendidikan Dan Kebudayaan (JURDIKBUD)*, *4*(1), 69–76.

Liriwati, F. Y. (2023). Revolusi digital dan merdeka belajar: Meningkatkan daya saing siswa di era teknologi. *Journal Innovation In Education*, *1*(3), 221–231.

Mambu, J. G. Z., Pitra, D. H., Ilmi, A. R. M., Nugroho, W., Leuwol, N. V, & Saputra, A. M. A. (2023). Pemanfaatan Teknologi Artificial Intelligence (AI) Dalam Menghadapi Tantangan Mengajar Guru di Era Digital. *Journal on Education*, *6*(1), 2689–2698.

Meilinda, N., Malinda, F., & Aisyah, S. M. (2020). Literasi digital pada remaja digital (Sosialisasi pemanfaatan media sosial bagi pelajar Sekolah Menengah Atas). *Jurnal Abdimas Mandiri*, *4*(1).

Mobonggi, A. H., Amala, R., & Pulubuhu, M. F. (2023). Challenges And Opportunities In The Digital Transformation Of Islamic Educational Institutions. *Irfani (e-Journal)*, *19*(2), 131–139.

Muzakir, U., Baharuddin, B., Manuhutu, A., & Widoyo, H. (2023). Penerapan Kecerdasan Buatan Dalam Sistem Informasi: Tinjauan Literatur Tentang Aplikasi, Etika, dan Dampak Sosial. *Jurnal Review Pendidikan Dan Pengajaran (JRPP)*, *6*(4), 1163–1169.

Nurdyansyah, N. (2017). Sumber daya dalam teknologi pendidikan. *Universitas Muhammadiyah Sidoarjo*.

Panjaitan, N. Q., Yetti, E., & Nurani, Y. (2020). Pengaruh media pembelajaran digital animasi dan kepercayaan diri terhadap hasil belajar pendidikan agama islam anak. *Jurnal Obsesi: Jurnal Pendidikan Anak Usia Dini*, *4*(2), 588–596.

Purba, A., & Saragih, A. (2023). Peran Teknologi dalam Transformasi Pendidikan Bahasa Indonesia di Era Digital. *All Fields of Science Journal Liaison Academia and Sosiety*, *3*(3), 43–52.

Rahmadayanti, D., & Hartoyo, A. (2022). Potret kurikulum merdeka, wujud merdeka belajar di sekolah dasar. *Jurnal Basicedu*, *6*(4), 7174–7187.

Rambung, O. S., Sion, S., Bungamawelona, B., Puang, Y. B., & Salenda, S. (2023). Transformasi Kebijakan Pendidikan Melalui Implementasi Kurikulum Merdeka Belajar. *JIP: Jurnal Ilmu Pendidikan*, *1*(3), 598–612.

Rivalina, R. (2014). Kompetensi teknologi informasi dan komunikasi guru dalam peningkatan kualitas pembelajaran. *Jurnal Teknodik*, 165–176.

Rusmana, D. (2020). Pengaruh Keterampilan Digital Abad 21 pada Pendidikan Kewirausahaan untuk meningkatkan kompetensi kewirausahaan peserta didik SMK. *Jurnal Ekonomi Pendidikan Dan Kewirausahaan*, *8*(1), 17–32.

Shabir, A. (2022). Ujicoba penggunaan teknologi virtual reality sebagai media pembelajaran. *Jurnal Pendidikan Tambusai*, *6*(1), 696–702.

Surachman, A., Putri, D. E., & Nugroho, A. (2024). Transformasi Pendidikan di Era Digital Tantangan dan Peluang. *Journal of International Multidisciplinary Research*, *2*(2), 52–63.

Suweta, I. M. (2023). Sinergi Teknologi dalam Kurikulum Pembelajaran yang Positif (Studi pada Sekolah Harapan Mulia Bali). *Metta: Jurnal Ilmu Multidisiplin*, *3*(4), 425–438.

Waliulu, Y. S., Sos, S., Kom, M. I., Wahid, S. E., Arif, H. M., Deyidi Mokoginta, S. T., Rian Novita, S. E., Rukhmana, T., Asep Deni, M. M., & Sentryo, I. (2023). *Pendidikan Dalam Transformasi Digital*. Cendikia Mulia Mandiri.

Winarsih, N., Musliha, S., Septiana, W., & Faize, S. N. (2024). Analisis Perspektif Guru Dalam Penerapan Kurikulum Merdeka Belajar Dan Dampaknya Pada Pembelajaran Di Kabupaten Probolinggo. *DISCOURSE: Indonesian Journal of Social Studies and Education*, *1*(2), 81–92.

Yuniani, A., Ardianty, D. I., & Rahmadani, W. A. (2019). Era revolusi industri 4.0: peran media sosial dalam proses pembelajaran fisika di SMA. *GRAVITASI: Jurnal Pendidikan Fisika Dan Sains*, *2*(01), 18–24.

Zebua, E. N. K., & Zebua, N. (2024). Analisis Prinsip dan Peran Asesmen Autentik pada Proses dan Hasil Belajar Peserta Didik. *Edukasi Elita: Jurnal Inovasi Pendidikan*, *1*(2), 128–136.