Hipkin Journal of Educational Research | e-ISSN 1234-5678 & p-ISSN 1234-5678
Volume 2 No 3 (2025) 335-346

Hipkin Journal of Educational Research
http://ejournal-hipkin.or.id/index.php/hipkin-jer/

The curriculum development team's role in facilitating technology learning at SD Budiluhur

Najwa Nabila Hermawan
Universitas Pendidikan Indonesia, Bandung, Indonesia
najwanabila11@upi.edu

ABSTRACT

The digital transformation in education requires elementary schools to equip students with technological skills from an early age. Adaptive and integrative curricula, such as the Kurikulum Merdeka, offer significant opportunities to develop digital literacy through contextual and project-based learning. However, challenges such as limited facilities and insufficient teacher training remain obstacles to implementing ICT-based learning. This study aims to describe the role of the curriculum development team in shaping students' technology competence at SD Budiluhur. A descriptive qualitative approach was employed, using interviews and observations involving teachers, the principal, and members of the curriculum development team. The findings indicate that the team actively contributes to the design of technology-integrated teaching materials, the selection of appropriate digital tools, and the provision of ongoing teacher training. The curriculum implemented at SD Budiluhur has enhanced students' interest and ability to use technology wisely and productively. This study highlights the importance of collaboration and innovative curriculum strategies in creating a learning environment that is responsive to technological advancements.

ARTICLE INFO

Article History:
Received: 9 Aug 2025
Revised: 3 Nov 2025
Accepted: 10 Nov 2025
Publish online: 12 Dec 2025
Keywords:
curriculum development; Kurikulum Merdeka; primary school; technology competence

Open access
Hipkin Journal of Educational Research is a peer-reviewed open-access journal.

ABSTRAK

Transformasi digital dalam dunia pendidikan menuntut sekolah dasar untuk membekali murid dengan keterampilan teknologi sejak dini. Kurikulum yang adaptif dan integratif, seperti Kurikulum Merdeka, memberikan peluang besar untuk mengembangkan literasi digital melalui pembelajaran yang kontekstual dan berbasis proyek. Namun, tantangan seperti keterbatasan fasilitas dan kurangnya pelatihan guru masih menjadi hambatan dalam implementasi pembelajaran berbasis TIK. Penelitian ini bertujuan untuk menggambarkan peran Tim Pengembang Kurikulum (TPK) dalam membentuk kompetensi teknologi murid di SD Budiluhur. Penelitian ini menggunakan pendekatan kualitatif deskriptif dengan metode wawancara dan observasi terhadap guru, kepala sekolah, dan anggota TPK. Temuan menunjukkan bahwa TPK berperan aktif dalam merancang materi ajar berbasis teknologi, memilih perangkat digital yang sesuai, serta memberikan pelatihan berkelanjutan kepada guru. Kurikulum yang diterapkan di SD Budiluhur mampu meningkatkan minat dan kemampuan murid dalam menggunakan teknologi secara bijak dan produktif. Penelitian ini menegaskan pentingnya kolaborasi dan strategi kurikulum yang inovatif untuk menciptakan lingkungan belajar yang responsif terhadap perkembangan teknologi.

Kata Kunci: *kompetensi teknologi; kurikulum merdeka; pengembangan kurikulum; sekolah dasar*

How to cite (APA 7)
Hermawan, N. N. (2025). The curriculum development team's role in facilitating technology learning at SD Budiluhur. *Hipkin Journal of Educational Research, 2*(3), 335-346.

Peer review
This article has been peer-reviewed through the journal's standard double-blind peer review, where both the reviewers and authors are anonymised during review.

Copyright
2025, Najwa Nabila Hermawan. This an open-access is article distributed under the terms of the Creative Commons Attribution-ShareAlike 4.0 International (CC BY-SA 4.0) https://creativecommons.org/licenses/by-sa/4.0/, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author, and source are credited. *Corresponding author: najwanabila11@upi.edu

https://doi.org/10.64014/hipkin-jer.v2i3.232

INTRODUCTION

Digital transformation in education underscores the importance of strengthening technological competence from the earliest levels. Schools are not only required to produce graduates who can read and count, but also to equip them with digital literacy skills that are in step with the times. The integration of technology into the development of the elementary school curriculum can enhance learning effectiveness and the relevance of teaching materials to students' needs in the digital era (Mustakim *et al*., 2024). The Kurikulum Merdeka, currently implemented in Indonesia, provides schools with flexibility to design learning that is contextual, project-based, and aligned with students' needs. This curriculum encourages the development of 21st-century skills, such as critical, creative, collaborative, and communicative thinking. In this context, integrating Technology, Information, and Communication (ICT) is an excellent opportunity to train students to use technology as a productive and reflective tool from an early age (Awaluddin & Hadi, 2025).

Nevertheless, the challenges of implementing ICT in elementary schools remain substantial. Problems such as limited facilities, inadequate teacher training, and a digital divide between regions require a strategic, collaborative approach. Comparative studies show that Indonesia and Thailand face similar challenges in the use of digital media in the Kurikulum Merdeka, particularly in device readiness and teacher training (Marmoah *et al*., 2025).

One key to the success of ICT integration in learning is the active role of the Curriculum Development Team (TPK). This team is responsible for designing, compiling, and implementing the school's operational curriculum, as well as developing teaching tools such as Learning Outcomes (CP), Learning Goal Flows (ATP), and teaching modules. In implementing the Independent Curriculum, establishing TPK is an important first step. TPK plays a role in compiling the Operational Curriculum of the Education Unit (KOSP) and ensuring that the curriculum implemented is in accordance with the needs and characteristics of students in the school (Fitri *et al*., 2022). Collaboration among teachers, principals, and other stakeholders is critical to designing innovative and meaningful learning experiences.

In the context of basic education in Indonesia, four important terms are interrelated and play a significant role in the learning process and curriculum development. First, the Independent Curriculum is an educational policy that provides flexibility to educational units and educators to develop learning experiences that align with students' needs and potential, with a focus on strengthening essential character and competencies (Heryanti *et al*., 2023). This curriculum emphasizes student-centered learning, technology integration, and strengthening the Pancasila Student Profile through character-based projects. Its implementation aims to create a learning atmosphere that is fun and relevant to the times (Pratiwi & Slamet, 2024).

Elementary School (SD) is the first level of formal education for children. It is an important foundation for shaping children's initial attitudes and competencies as they progress to the next level of education. The success of curriculum implementation at this level depends heavily on teachers' roles, school support, and a learning system that is adaptive to changing times. One important aspect in supporting the success of basic education is technological competence. Technology competence refers to the ability of individuals, especially educators, to integrate ICT into the learning process effectively and efficiently (Ekantiningsih & Sukirman, 2023). In the digital era, educators are required to have knowledge and skills in using various technological devices and applications to support teaching and learning. Improving this technological competence can be done through competency-based training and education designed to meet the learning needs of the 21st century (Arifin & Mu'id, 2024; Djuriah & Hendra, 2023). Based on this, this study aims to explore the role of TPK in designing and implementing ICT learning in SD Budiluhur. The results of this

https://doi.org/10.64014/hipkin-jer.v2i3.232

research are expected to contribute to curriculum development practices in elementary schools, especially in strengthening digital literacy through adaptive and collaborative approaches.

LITERATURE REVIEW

Independent Curriculum and ICT Integration in Elementary Schools

Curriculum development is a strategic process that adapts learning materials to the needs of the times and student competencies. According to Fitria, in the book "Curriculum Development Management in the Digital Era, the role of TPK is important so that there is synergy between the school's vision, student needs, and national policies. Curriculum development can be defined as the process of planning and preparing the curriculum by curriculum developers, as well as a series of activities carried out to ensure the resulting curriculum serves as teaching materials and references to achieve national education goals. This process not only involves preparing documents but also considers various aspects, including students' and society's needs and the direction of educational programs (Ekantiningsih & Sukirman, 2023). This team is not only responsible for preparing curriculum documents but also facilitates training and coordination among teachers. Good collaboration among teachers, principals, and education committees significantly impacts the effectiveness of curriculum implementation. Decision-making involving various stakeholders also strengthens stakeholders' sense of ownership of the implemented curriculum.

According to the Ministry of Education and Culture, the Independent Curriculum provides schools with flexibility to design project-based learning and address student needs, including strengthening digital literacy (see: https://kurikulum.gtk.kemdikbud.go.id). This curriculum encourages flexibility in arranging teaching materials, adapting students' learning styles, and enabling teachers to develop learning innovations. This is an excellent opportunity for schools to integrate ICT into 21st-century competencies, such as critical, creative, collaborative, and communicative thinking skills (H. Scientific & Salehudin, 2024; Humayra, 2025; Murniyati, 2025).

In ICT learning, a project-based approach and the use of interactive digital media are considered effective in increasing students' motivation and practical skills. Students are not only users of technology but also producers of digital content appropriate to their age and learning context. *Fun, engaging learning and integrative methods are considered effective in developing* technology skills from an early age (Riyadi & Maulana, 2023). For example, through digital presentations, greeting card design, or short videos, students learn to think logically, work in groups, and express ideas visually.

Challenges of Technology Curriculum Implementation

Some challenges in implementing the ICT curriculum at the basic level include limited infrastructure, network constraints, and differences in students' learning speeds. On the other hand, many primary schools in semi-urban areas face technical barriers, such as an imbalance between the number of devices and pupils and unstable internet connectivity (Aswad & Badrun, 2025; Koinmanas & Taka, 2025). Teachers are required to be able to adapt and be flexible in delivering material so that all students can follow optimally because this is related to the importance of digital pedagogic skills in modifying teaching approaches based on student needs (Anggraini *et al.,* 2025; Aprilia & Mustika, 2024; Pane *et al.,* 2025).

When facing challenges during the implementation of this technology curriculum, adaptive strategies are needed, such as the insertion of *fun learning* methods, educational games, or team-based projects (Rosa *et al.,* 2024; Stachová *et al.,* 2025; Özener, 2024). *Game-based learning* not only increases student engagement but also simplifies the understanding of technology concepts for elementary students (Hunt

https://doi.org/10.64014/hipkin-jer.v2i3.232

et al., 2023; Manurung *et al.,* 2024). In addition, collaborative project-based learning is recognized as effective in developing students' social skills and critical thinking (Darwis *et al.,* 2025).

Furthermore, schools need to have a routine evaluation system involving ICT teachers, homeroom teachers, and principals to adapt the curriculum to student dynamics and rapid technological developments. Reflective cycles are needed in the development of technology-based curricula (Dosinaeng *et al.,* 2025; Nurjaya *et al.,* 2025). They stated that the success of ICT integration is primarily determined by the institution's ability to accommodate feedback and changes in education technology policies. Thus, adaptive strategies, stakeholder collaboration, and dynamic evaluation systems are key to the successful implementation of a responsive and sustainable ICT curriculum at the elementary school level.

METHODS

This research uses a qualitative method. The qualitative approach was chosen because it can provide an in-depth understanding of the field's context and dynamics, as well as emphasize the meanings arising from subjective interpretations of social experiences and realities (Kuecker, 2021). This method emphasizes the process, meaning, and significance of the subject to the phenomenon being studied. The data collection techniques used in this study include in-depth interviews, direct observation, and document analysis.

This research was conducted at SD Budiluhur, selected as the research site based on the results of the initial survey and the school's readiness to implement Information and Communication Technology (ICT) learning. The selection of the research location is based on several criteria, namely the presence of an active TPK, adequate ICT laboratory facilities, and the school's openness to the implementation of academic research.

The subjects of this study are the Vice Principal for Curriculum and the ICT Teachers. The two speakers were chosen because they have a strategic role in planning, compiling, and implementing the ICT curriculum in schools. Data collection was carried out through semi-structured interviews and observations. The researcher developed a semi-structured interview guideline to explore curriculum planning, the implementation of ICT learning, the obstacles encountered, and the curriculum evaluation process.

In addition to interviews and observations, data collection is conducted through document analysis. The documents analyzed included the school curriculum, syllabus, Learning Implementation Plan (RPP), and Student Worksheets (LKS) books used in ICT learning. The data obtained was then analyzed using a thematic approach. The analysis was carried out by identifying the main themes that emerged from the similarity in the patterns of answers and statements from the speakers.

RESULTS AND DISCUSSION

Curriculum Implementation and Transition Strategy

The results of the interview with the Vice Principal for curriculum indicate that SD Budiluhur currently implements two curricula in parallel: the Independent Curriculum for grades 1 to 5 and the 2013 Curriculum for grade 6. This strategy reflects a gradual, adaptive approach to national education policies. The school has also planned to implement a deep learning approach in the upcoming school year, in line with the Ministry of Education's latest directives.

https://doi.org/10.64014/hipkin-jer.v2i3.232

The TPK structure at SD Budiluhur involves the principal, vice principal for curriculum, class teachers, school committees, and parent representatives. The curriculum is prepared during an annual work meeting held before the new school year, in a participatory manner, to ensure that the learning plan aligns with students' characteristics and the school's vision. Considering that SD Budiluhur is a tahfidz-based school, religious routines such as duha prayers, daily tahfidz, and moral development are part of the daily agenda that also affect the allocation of academic learning time, including ICT subjects.

ICT Learning Practices

ICT subjects are categorized as local content and listed on the report card as extracurricular activities, but they are implemented routinely for 2 hours of lessons per week for grades 3 to 6. The material taught includes an introduction and practice with various digital applications, such as Microsoft Office (Word, Excel, PowerPoint), Canva for design, and CapCut for video creation. The approach used by teachers is *fun, interactive learning, accompanied by games and digital quizzes, so* students stay enthusiastic and do not feel bored.

For lower-grade students, learning focuses on a basic introduction to hardware and how to operate a computer. Meanwhile, upper-class students have begun training with more complex applications to improve their digital productivity and creativity. Learning evaluations are conducted through a variety of methods, including daily assessments, mid- and end-of-semester exams, skills assessments, and project-based assessments such as short film making and student farewell videos.

Parent Facilities, Evaluation, and Collaboration

Computer laboratories support ICT learning, although the number of devices remains limited. Several obstacles, such as computer damage, especially during the implementation of the Computer-Based National Assessment (ANBK), are challenges in themselves. Schools address this by rescheduling and using devices in turn. Despite the limitations, the students' enthusiasm for ICT lessons is very high, as evidenced by their habit of waiting outside the laboratory before the lesson starts.

Evaluation of learning implementation is conducted through principal supervision, classroom observations, and teacher reports. In addition, the school establishes active cooperation with parents to monitor the use of digital devices at home, as a form of supervision to prevent potential misuse of gadgets by students. This collaboration supports the development of responsible, ethical digital literacy from an early age.

https://doi.org/10.64014/hipkin-jer.v2i3.232

Figure 1. Computer Lab Room of SD Budiluhur
Source: Author documentation 2024

Figure 1 shows documentation of the computer laboratory at SD Budiluhur. Despite the limited number of devices, this laboratory still functions optimally. The availability of special ICT spaces is an important indicator of the school's commitment to technology learning. The use of this space is arranged on a rotating basis and neatly scheduled so that all classes get equal learning opportunities.

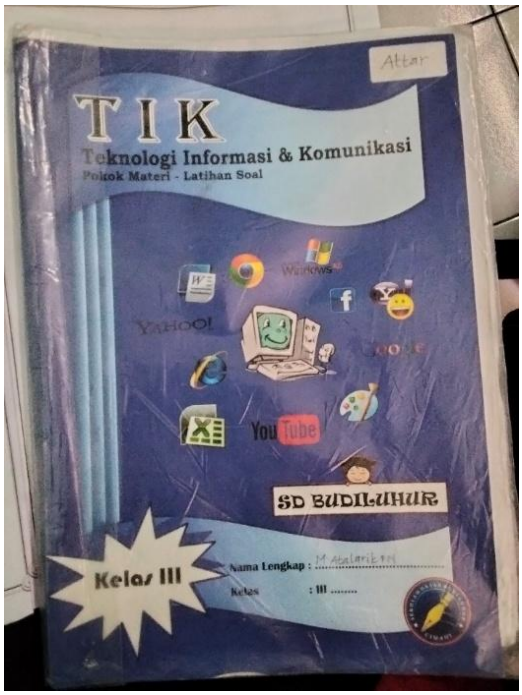


Figure 2. A Collection of Books for Elementary School Teaching
Source: Author documentation 2024

Figure 2 shows the ICT subject worksheet used in the learning process. This worksheet contains a structured and applicable guide for student learning activities. The existence of LKS supports student independent learning and serves as a tool for teachers to direct practice-based learning activities.

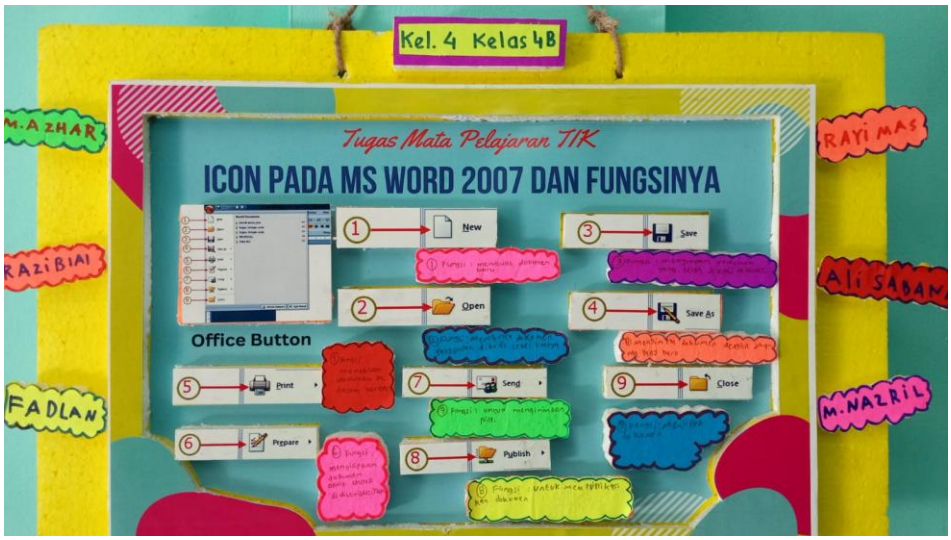
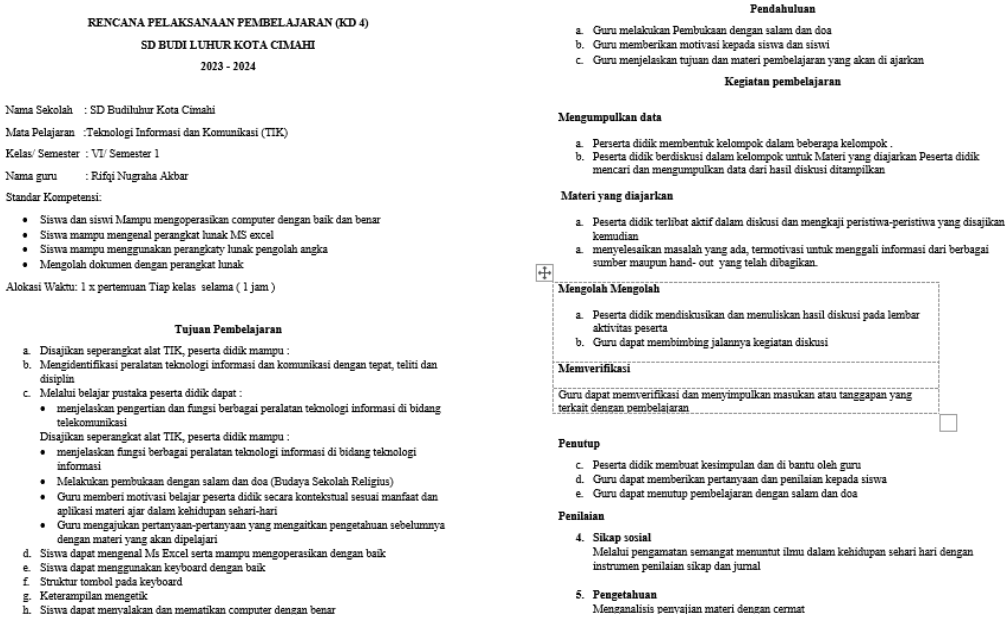


Figure 3. Project Results
Source: Author documentation 2024

https://doi.org/10.64014/hipkin-jer.v2i3.232

Figure 3 shows the results of the 4th-grade students' project, which involved creating application icons using styrofoam media, designed in advance in *Microsoft Word*. The project is part of a project-based learning approach that not only encourages students' creativity and visual expression, but also accustoms them to combine digital and craft skills productively. This kind of activity trains students to apply the technical skills they have learned in class, while also developing collaboration, communication, and digital literacy skills in a real-world context.



RENCANA PELAKSANAAN PEMBELAJARAN (KD 4)

SD BUDI LUHUR KOTA CIMAHI

2023 - 2024

Nama Sekolah : SD Budiluhur Kota Cimahi

Mata Pelajaran :Teknologi Informasi dan Komunikasi (TIK)

Kelas/ Semester : VI/ Semester 1

Nama guru : Rifqi Nugraha Akbar

Standar Kompetensi:

- Siswa dan siswi Mampu mengoperasikan computer dengan baik dan benar
- Siswa mampu mengenal perangkat lunak MS excel
- Siswa mampu menggunakan perangkaty lunak pengolah angka
- Mengolah dokumen dengan perangkat lunak

Alokasi Waktu: 1 x pertemuan Tiap kelas selama (1 jam)

Tujuan Pembelajaran

a. Disajikan seperangkat alat TIK, peserta didik mampu :
b. Mengidentifikasi peralatan teknologi informasi dan komunikasi dengan tepat, teliti dan disiplin
c. Melalui belajar pustaka peserta didik dapat :
   - menjelaskan pengertian dan fungsi berbagai peralatan teknologi informasi di bidang telekomunikasi

   Disajikan seperangkat alat TIK, peserta didik mampu :
   - menjelaskan fungsi berbagai peralatan teknologi informasi di bidang teknologi informasi
   - Melakukan pembukaan dengan salam dan doa (Budaya Sekolah Religius)
   - Guru memberi motivasi belajar peserta didik secara kontekstual sesuai manfaat dan aplikasi materi ajar dalam kehidupan sehari-hari
   - Guru mengajukan pertanyaan-pertanyaan yang mengaitkan pengetahuan sebelumnya dengan materi yang akan dipelajari
d. Siswa dapat mengenal Ms Excel serta mampu mengoperasikan dengan baik
e. Siswa dapat menggunakan keyboard dengan baik
f. Struktur tombol pada keyboard
g. Keterampilan mengetik
h. Siswa dapat menyalakan dan mematikan computer dengan benar

Pendahuluan

a. Guru melakukan Pembukaan dengan salam dan doa
b. Guru memberikan motivasi kepada siswa dan siswi
c. Guru menjelaskan tujuan dan materi pembelajaran yang akan di ajarkan

Kegiatan pembelajaran

Mengumpulkan data

a. Perserta didik membentuk kelompok dalam beberapa kelompok .
b. Peserta didik berdiskusi dalam kelompok untuk Materi yang diajarkan Peserta didik mencari dan mengumpulkan data dari hasil diskusi ditampilkan

Materi yang diajarkan

a. Peserta didik terlibat aktif dalam diskusi dan mengkaji peristiwa-peristiwa yang disajikan kemudian
a. menyelesaikan masalah yang ada, termotivasi untuk menggali informasi dari berbagai sumber maupun hand- out yang telah dibagikan.

Mengolah Mengolah

a. Peserta didik mendiskusikan dan menuliskan hasil diskusi pada lembar aktivitas peserta
b. Guru dapat membimbing jalannya kegiatan diskusi

Memverifikasi

Guru dapat memverifikasi dan menyimpulkan masukan atau tanggapan yang terkait dengan pembelajaran

Penutup

c. Peserta didik membuat kesimpulan dan di bantu oleh guru
d. Guru dapat memberikan pertanyaan dan penilaian kepada siswa
e. Guru dapat memutup pembelajaran dengan salam dan doa

Penilaian

4. **Sikap sosial**
   Melalui pengamatan semangat menuntut ilmu dalam kehidupan sehari hari dengan instrumen penilaian sikap dan jurnal

5. **Pengetahuan**
   Menganalisis penyajian materi dengan cermat

Figure 4. ICT Subject RPP
Source: Author documentation 2024

Figure 4 shows the teacher-prepared Learning Implementation Plan (RPP) for ICT subjects. The lesson plan reflects structured and adaptive learning objectives that lead to mastery of digital literacy, the use of digital media, and the strengthening of students' character in a digital context.

Discussion

The integration of ICT at SD Budiluhur demonstrates that a context-based, participatory learning approach can significantly improve students' technological competence. This is related to the success of technology integration in primary education, not only to the availability of facilities but also to teachers' readiness and the synergy built through TPK (Alghamdi, 2023). At SD Budiluhur, collaboration between teachers, principals, and school committees plays an important role in supporting an adaptive and sustainable digital learning ecosystem.

ICT teachers play a role not only as facilitators of technology use but also as developers of contextual and interactive teaching materials. They prepare lesson plans that are tailored to the school context and student characteristics. ICT teachers who are involved from the curriculum-planning stage can prepare lesson plans that are more applicable and responsive to students' needs (Hartati, 2020). In addition, regular teacher training can improve technology-based pedagogical competence. Activities such as teacher community training, educational technology seminars, and the sharing of best practices between schools are important for strengthening ICT teachers' capacity.

The *fun and project-based learning approaches applied in ICT subjects, such as video creation, presentation design, and the use of simple graphic applications, have been proven* to encourage students'

https://doi.org/10.64014/hipkin-jer.v2i3.232

motivation and creativity. This aligns with the statement that the role of interactive digital tools in the development of digital literacy from an early age (Sailer *et al*., 2021). Furthermore, this approach is also relevant to Vygotsky's theory of social constructivism, which holds that meaningful learning occurs in a social context and is situated in the zone of proximal development (Irshad *et al.,* 2021; Mishra, 2023; Shibina & Vidyapeetham, 2022).

The involvement of parents in supervising the use of gadgets at home strengthens the collaborative pattern, one of SD Budiluhur's strengths. Family support and curriculum flexibility contribute significantly to the success of ICT implementation (Hartanto & Mulyani, 2021). In this context, SD Budiluhur has demonstrated effective collaborative practices, where parents are part of the supervision and development system for students' digital literacy. Despite challenges such as device limitations and computer malfunctions during ANBK, many elementary schools still struggle to access adequate ICT infrastructure (Asfiana *et al.,* 2025; Purwati *et al.,* 2025). However, SD Budiluhur was able to get around this by rescheduling and using devices in turn, demonstrating managerial flexibility and commitment to the sustainability of digital learning.

In terms of evaluation, the practices carried out at SD Budiluhur, namely principal supervision, classroom observation, and project-based assessment, are a form of reflective evaluation that supports continuous improvement. With this reflective evaluation cycle, technology-based curriculum in elementary schools can be further developed (Dosinaeng *et al.,* 2025; Judge, 2025; Nurjaya *et al.,* 2025). The uniqueness of SD Budiluhur lies in the integration of spiritual values in assessment, where the moral aspect is part of the indicator of learning success. This approach creates a balance between digital proficiency and character building, especially in the context of tahfidz-based schools.

In addition, the results of this study align with previous findings that the use of technology in curriculum development and social studies learning design in elementary schools must be grounded in contextual understanding, teacher participation, and school managerial support (Mustakim *et al*., 2024). In the context of SD Budiluhur, ICT integration is not only used as a learning tool, but also as a structured part of curriculum planning and development. TPK's active role in designing digital lesson plans and syllabi underscores the importance of teacher involvement in the curriculum development process to meet students' learning needs. This approach encourages alignment between learning objectives and the development of students' digital competencies in the current era. In addition, the focus of ICT learning at SD Budiluhur is not limited to technical aspects, such as creating digital media (presentations, videos, and designs), but also includes strengthening character and spiritual values. The integration between mastery of technology and the formation of morals makes the approach to ICT learning at SD Budiluhur holistic and contextual, in accordance with the school's identity as a tahfidz-based institution. To be more optimal, the ICT learning development strategy at SD Budiluhur can still be strengthened through sustainable teacher training aligned with actual field needs. Relevant training and infrastructure support are the main foundations in creating effective ICT learning at the primary education level (Perisic *et al.,* 2023; Sofiana *et al.,* 2025).

Overall, the active involvement of various parties in the development of the curriculum and in the implementation of ICT learning at SD Budiluhur is an example of good practice that can be replicated in other elementary schools. Especially for faith-based schools, an approach that balances spiritual values with mastery of 21st-century skills can be a holistic, adaptive educational model. In this regard, it is hoped that schools can support through policies, facilities, and ongoing training. Students are also instructed to use technology wisely and productively, as a technology-adaptive curriculum can improve the overall quality of education (Setiyorini & Setiawan, 2023).

CONCLUSION

https://doi.org/10.64014/hipkin-jer.v2i3.232

Technology-based learning at SD Budiluhur shows a relatively mature integration between curriculum planning, classroom implementation, and continuous evaluation. Through *a fun learning* approach and digital projects, students are not only introduced to devices and applications, but also invited to develop creativity, collaboration, and digital responsibility. Infrastructure support, although limited, is still maximized through efficient use strategies and stakeholder collaboration. In addition, the involvement of parents, teachers, and principals is an important element in building an adaptive, context-based learning ecosystem.

Thus, it can be concluded that the role of TPK at SD Budiluhur is not only administrative, but also transformative. They are the main drivers of technological learning that does not rely solely on tools or devices, but is really oriented towards the holistic development of student competencies. The success of technology-based learning in schools cannot be separated from the synergy between the school's vision, teachers' abilities, student readiness, and strategic support from TPK.

Based on the research results, it is suggested that TPK continue innovating to develop a technology-based curriculum that is relevant to the times. Teachers are expected to improve their digital competencies to implement technology learning effectively. In addition, for further research, it is recommended to explore in greater depth the impact of technology learning on student learning outcomes.

AUTHOR'S NOTE

The author declares that there is no conflict of interest related to the publication of this article. The author emphasizes that the article's data and content are free of plagiarism.

REFERENCES

Alghamdi, A. K. H. (2023). Technology integration in elementary education: Opportunities and challenges. *Education and Information Technologies, 28*(1), 149-165.

Anggraini, T., Irma, A., & Revita, R. (2025). Tantangan dan solusi dalam implementasi kompetensi pedagogik di sekolah menengah atas. *Munaqasyah: Jurnal Ilmu Pendidikan dan Pembelajaran*, *7*(1), 30-45.

Aprilia, M., & Mustika, D. (2024). Implementation of the teacher's role in implementing the kurikulum merdeka in elementary school. *Inovasi Kurikulum*, *21*(2), 583-594.

Arifin, B., & Mu'id, A. (2024). Pengembangan kurikulum berbasis keterampilan dalam menghadapi tuntutan kompetensi abad 21. *Daarus Tsaqofah Jurnal Pendidikan Pascasarjana Universitas Qomaruddin*, *1*(2), 118-128.

Asfiana, A., Fitriyani, F., & Rokhimawan, M. A. (2025). Analisis tantangan dan kelebihan pembelajaran berbasis teknologi informasi dan komunikasi pada kurikulum merdeka di sekolah dasar. *Ideguru: Jurnal Karya Ilmiah Guru*, *10*(1), 187-193.

Aswad, F. H., & Badrun, M. (2025). Peran kompetensi pedagogik guru PPPK dalam meningkatkan kualitas pembelajaran: Studi kasus di SMP Negeri 1 Talangpadang. *Manajemen Pendidikan, 20*(1), 231-242.

https://doi.org/10.64014/hipkin-jer.v2i3.232

Awaluddin, A., & Hadi, M. S. (2025). Integrasi pembelajaran coding dan kecerdasan buatan di sekolah dasar: Tantangan dan peluang. *Pendas: Jurnal Ilmiah Pendidikan Dasar*, *10*(1), 1081-1086.

Darwis, M., Azizah, N., & Rofiqoh, S. (2025). Peran pembelajaran berbasis proyek terhadap pengembangan keterampilan berpikir kritis siswa. *Jurnal Pendidikan Guru Sekolah Dasar*, *2*(2), 1-7.

Djuariah, D., & Hendra, A. (2023). Pengembangan kompetensi sumber daya manusia melalui pendidikan berbasis keterampilan abad 21. *Shibyan: Jurnal Pendidikan Guru Madrasah Ibtidaiyah*, *1*(2), 101-113.

Dosinaeng, W. B. N., Naen, A. B., Wariani, T., & Djong, K. D. (2025). Pelatihan penelitian tindakan sekolah bagi kepala sekolah dalam pengembangan mutu pendidikan. *Berbakti: Jurnal Pengabdian kepada Masyarakat*, *3*(1), 28-39.

Ekantiningsih, P. D., & Sukirman, D. (2023). Trends of education and training teacher competency in information and communication technology. *Jurnal Inovasi Teknologi Pendidikan*, *10*(1), 87-105.

Fitri, R., Gistituati, N., & Bentri, A. (2022). Implementasi kurikulum merdeka pada tingkat satuan pendidikan SMA: Tinjauan perencanaan IKM. *Pedagogi Hayati*, *6*(2), 78-84.

Hartanto, D., & Mulyani, S. (2021). Kolaborasi orang tua dan guru dalam implementasi TIK pada sekolah dasar negeri di Jawa Tengah. *Jurnal Pendidikan Dasar Indonesia, 6*(3), 221-231.

Hartati, S. (2020). Peran Guru TIK dalam Implementasi Kurikulum di sekolah dasar. *Jurnal Teknologi Pendidikan Dasar, 5*(2), 34-42.

Heryanti, Y. Y., Muhtar, T., & Herlambang, Y. T. (2023). Makna dan implementasi kurikulum merdeka belajar dan relevansinya bagi perkembangan siswa di sekolah dasar: Telaah kritis dalam tinjauan pedagogis. *Jurnal Elementaria Edukasia*, *6*(3), 1270-1280.

Hilmiah, H., & Salehudin, M. (2024). Peran TIK pada pembelajaran abad 21 dalam keterampilan kritis, kreatif dan kolaboratif anak usia dini. *Journal of Instructional and Development Researches*, *4*(6), 609-618.

Hukom, J. (2025). Kritik terhadap praktik asesmen formatif di sekolah dasar: Implementasi, kendala, dan solusi penguatan. *Jurnal Ilmu Pendidikan Guru Sekolah Dasar dan Usia Dini*, *2*(3), 40-45.

Humayra, N. S., Ananti, H. F., Norlia, N., & Murdianingsih, A. (2025). Integrasi teori pembelajaran bahasa untuk penguatan pembelajaran abad ke-21 dalam konteks pendidikan Bahasa Indonesia. *Jurnal Penelitian Inovatif*, *5*(1), 577-588.

Hunt, J. H., Taub, M., Marino, M., Duarte, A., Bentley, B., Holman, K., & Kuhlman, A. (2023). Effects of game-enhanced supplemental fraction curriculum on student engagement, fraction knowledge, and STEM interest. *Education Sciences*, *13*(7), 1-24.

Irshad, S., Maan, M. F., Batool, H., & Hanif, A. (2021). Vygotsky's Zone of Proximal Development (ZPD): An evaluative tool for language learning and social development in early childhood education. *Multicultural Education*, *7*(6), 234-242.

Koinmanas, H. A., & Taka, L. M. (2025). Pengenalan dini wisata lokal bagi anak sekolah dasar melalui pendekatan interaktif di UPTD SD Negeri Asam Tiga Naibonat, Kab. Kupang. *Eastasouth Journal of Impactive Community Services*, *3*(3), 126-136.

Kuecker, E. (2021). The ethos of citation in qualitative research methodology. *Reconceptualizing Educational Research Methodology, 12*(2), 83-99.

https://doi.org/10.64014/hipkin-jer.v2i3.232

Manurung, M. N. U., Agung, A. A. G., & Suartama, I. K. (2024). Strategi kreatif multimedia pembelajaran interaktif berbasis game based learning pada muatan IPS. *Jurnal Media dan Teknologi Pendidikan*, *4*(1), 51-60.

Marmoah, S., Poerwanti, J. I. S., Supianto, S., Istiyati, S., Sukarno, S., & Mahfud, H. (2025). Comparative study of the implementation of digital learning media in the merdeka curriculum in Indonesia and Thailand. *Journal of Information Systems Engineering & Management, 10*(2), 241-247.

Mishra, N. R. (2023). Constructivist approach to learning: An analysis of pedagogical models of social constructivist learning theory. *Journal of research and development*, *6*(1), 22-29.

Murniyati, S. (2025). Transformasi pendidikan: Kebutuhan dan tantangan kompetensi guru dalam menghadapi era digital abad-21. *Janacitta*, *8*(2), 359-367.

Mustakim, M., Ajwar, M., Kertih, I. W., & Lasmawan, I. W. (2024). The use of technology in curriculum development and social studies learning design in elementary schools: A critical analysis and literature review. *Jurnal Humanitas: Katalisator Perubahan dan Inovator Pendidikan*, *10*(3), 489-504.

Nurjaya, I. G., Christiawan, P. I., Sarmita, M., & Resmawan, K. G. S. (2025). Pengembangan modul ajar berbasis Tri Hita Karana dalam pendidikan profesi guru: Integrasi nilai kearifan lokal dan alur merdeka. *Media Komunikasi FPIPS*, *24*(2), 133-144.

Özener, O. Ö. (2024). Context-based learning for BIM: Simulative role-playing games for strategic business implementations. *Smart and Sustainable Built Environment*, *13*(4), 908-933.

Pane, A., Sembiring, E. B., Harianja, L., Yopi, M. H. F., Simanjuntak, N. S. S., & Siboro, E. S. (2025). Kajian tentang pengembangan profesi guru dalam kompetensi pedagogik melalui penambahan pendekatan pada kurikulum merdeka. *Jurnal Inovasi Pendidikan dan Teknologi Informasi (JIPTI)*, *6*(1), 266-279.

Perisic, A., Perisic, I., Lazic, M., & Perisic, B. (2023). The foundation for future education, teaching, training, learning, and performing infrastructure - The open interoperability conceptual framework approach. *Heliyon*, *9*(6), 1-16.

Pratiwi, A. D., & Slamet, S. (2024). Literatur review: Relevansi penerapan kurikulum merdeka dengan konsep pemikiran ki hajar dewantara. *Jurnal Pembelajaran, Bimbingan, dan Pengelolaan Pendidikan*, *4*(9), 10-10.

Purwati, L. D., Murwaningsih, T., & Suryandari, K. C. (2025). Analisis kesiapan peserta didik dalam pembelajaran terhadap media literasi digital kelas vi sekolah dasar. *Didaktika: Jurnal Kependidikan*, *14*(3), 5131-5140.

Riyadi, T., & Maulana, I. (2023). Efektivitas strategi pembelajaran TIK di sekolah dasar melalui pendekatan fun learning. *Edukasi Jurnal Pendidikan, 21*(1), 128-142

Rosa, E., Destian, R., Agustian, A., & Wahyudin, W. (2024). Inovasi model dan strategi pembelajaran dalam implementasi kurikulum merdeka. *Journal of Education Research*, *5*(3), 2608-2617.

Sailer, M., Murböck, J., & Fischer, F. (2021). Digital learning in schools: What does it take beyond digital technology?. *Teaching and Teacher Education, 103*(1), 1-13.

Setiyorini, S. R., & Setiawan, D. (2023). Perkembangan kurikulum terhadap kualitas pendidikan di Indonesia. *Jurnal Teknologi Pendidikan, 1*(1), 1-12.

https://doi.org/10.64014/hipkin-jer.v2i3.232

Shibina, K. M., & Vidyapeetham, A. V. (2022). Social constructivism: A fundamental approach towards oral development. *Journal of Russian and Comparative Literary Studies*, *22*(1), 375-380.

Sofiana, A., Lubis, E. R., Agustina, K., & Fajriyah, R. Z. (2025). Kurikulum Merdeka Dan Literasi Digital: Evaluasi infrastruktur dan sumber daya sekolah. *Jurnal Ilmiah Wahana Pendidikan*, *11*(1), 181-186.

Stachová, K., Stacho, Z., & Hamar, M. (2025). Game-based intervention as a tool for enhancing team adaptation. *Administrative Sciences*, *15*(7), 1-12.

https://doi.org/10.64014/hipkin-jer.v2i3.232