

Implementation of the International Primary Curriculum (IPC): Strengthening 21st-Century Skills and Contributing to Sustainable Development Goals in Indonesia

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Abstract: This study aims to analyze the implementation of the International Primary Curriculum (IPC) in supporting 21st century education through strengthening critical thinking, creativity, communication, and collaboration (4C) skills, as well as evaluating its contribution to the achievement of the Sustainable Development Goals (SDGs), especially Goal 4: Quality Education. The method used is Systematic Literature Review (SLR) with the PRISMA approach, which involves searching the literature on the Scopus database, Google Scholar, and the Publish or Perish tool for the period 2020–2025. The results show that IPC significantly improves 4C skills through thematic, cross-disciplinary, and project-based learning that encourages student engagement, knowledge transfer, and an in-depth understanding of global and local issues. IPC's contribution is also seen in strengthening the principles of inclusivity, integrating sustainability values, and adapting learning that is relevant to the cultural context, so that it is in line with the SDGs agenda. However, the main challenges in its implementation in Indonesia include disparities in educational infrastructure, limited teacher capacity, and resource gaps between regions. The implications of this study underscore the importance of policy strategies that emphasize improving teacher competence, adapting the curriculum to local contexts, and collaboration between stakeholders to ensure sustainable implementation. Follow-up studies are recommended to explore the effectiveness of IPC implementation through field studies, longitudinal analysis of student learning outcomes, and evaluation of teacher training programs to strengthen the relevance and competitiveness of basic education in Indonesia.

Abstrak: Penelitian ini bertujuan untuk menganalisis implementasi Kurikulum International Primary Curriculum (IPC) dalam mendukung pendidikan abad ke-21 melalui penguatan keterampilan berpikir kritis, kreativitas, komunikasi, dan kolaborasi (4C), sekaligus mengevaluasi kontribusinya terhadap pencapaian Sustainable Development Goals (SDGs), khususnya Goal 4: Quality Education. Metode yang digunakan adalah Systematic Literature Review (SLR) dengan pendekatan PRISMA, yang melibatkan pencarian literatur pada basis data Scopus, Google Scholar, dan perangkat Publish or Perish untuk periode 2020–2025. Hasil penelitian menunjukkan bahwa IPC secara signifikan meningkatkan keterampilan 4C melalui pembelajaran tematik, lintas disiplin, dan berbasis proyek yang mendorong keterlibatan siswa, transfer pengetahuan, serta pemahaman mendalam atas isu global dan lokal. Kontribusi IPC juga terlihat pada penguatan prinsip inklusivitas, integrasi nilai keberlanjutan, dan adaptasi pembelajaran yang relevan dengan konteks budaya, sehingga sejalan dengan agenda SDGs. Meskipun demikian, tantangan utama dalam implementasinya di Indonesia mencakup disparitas infrastruktur pendidikan, keterbatasan kapasitas guru, serta kesenjangan sumber daya antarwilayah. Implikasi penelitian ini menegaskan

pentingnya strategi kebijakan yang menekankan peningkatan kompetensi guru, adaptasi kurikulum ke konteks lokal, dan kolaborasi antar pemangku kepentingan untuk menjamin keberlanjutan implementasi. Studi lanjutan direkomendasikan untuk mengeksplorasi efektivitas implementasi IPC melalui kajian lapangan, analisis longitudinal hasil belajar siswa, dan evaluasi program pelatihan guru guna memperkuat relevansi dan daya saing pendidikan dasar di Indonesia.

1. Introduction

21st-century education faces increasingly complex challenges due to the acceleration of globalization, technological revolution, and social dynamics that demand new skills from the younger generation.¹ The gap in access to digital technology in developing countries is widening the education disparity, particularly between urban and rural areas.² On the other hand, education is required not only to impart knowledge, but also to equip students with 21st-century skills, such as critical thinking, collaboration, communication, creativity, and digital literacy.³ This transformation in the educational paradigm emphasizes the relevance of a curriculum that is adaptive and responsive to global changes and the needs of the world of work.⁴ This emphasizes the importance of an innovative curriculum that can develop quality human resources to support sustainable development.

A number of previous studies have shown that traditional curricula still tend to emphasize knowledge transfer without developing higher-order thinking skills or sustainability values.⁵ This situation has led to a gap between educational outcomes and global needs, both in terms of job skills and contributions to global agendas such as the SDGs.^{6,7} In Indonesia, this challenge is exacerbated by regional disparities in education quality and limited education infrastructure. This shows that curriculum reform needs to be directed not only at reducing disparities, but also at building students' capacity to face the global era. Therefore, the urgency of curriculum innovation has become the center of contemporary academic discourse and education policy.

In a global context, 21st-century skills are often referred to as the 4Cs (critical thinking, creativity, communication, and collaboration), as popularized by the

¹ Walaa Al Husban, "The Impact of Integrating Sustainable Development Goals on Students' Awareness and Pro-Environmental Behavior: A Case Study of Jordan," *Sustainability* 17, no. 6 (2025), <https://doi.org/10.3390/su17062588>.

² Azwar Yusran Anas, Agus Wahyudi, and Nurliana Cipta Apsari, "Desa Dan Kota Dalam Potret Pendidikan," in *Prosiding Penelitian Dan Pengabdian Kepada Masyarakat*, 2015, 418–22, <https://doi.org/10.24198/jppm.v2i3.13592>.

³ Moh. Pudali Arodani et al., "Pendidikan Sekolah Dasar 2024: Menyiapkan Generasi Emas Dengan Keterampilan Abad 21," *Jurnal Ilmiah Research Student* 2, no. 1 (2025): 145–54, <https://doi.org/10.61722/jirs.v2i1.3633>.

⁴ Dendodi Dendodi et al., "Dampak Dan Tantangan Terhadap Transformasi Kurikulum Di Satuan Pendidikan," *Journal of Education Research* 5, no. 2 (April 18, 2024): 1071–80, <https://doi.org/10.37985/jer.v5i2.960>.

⁵ Gerry Mandala and Muhammad Aji Nugroho, "Rekonstruksi Sistem Pembelajaran PAI Yang Responsif Terhadap Kebutuhan Peserta Didik," *Journal of Innovative and Creativity* 5, no. 2 (July 19, 2025): 13922–32, <https://doi.org/10.31004/joecy.v5i2.1775>.

⁶ Lisdaleni Lisdaleni et al., "Problematisasi Pendidikan Islam Di Pesantren Dan Madrasah Di Era Globalisasi," *PUSTAKA: Jurnal Bahasa Dan Pendidikan* 2, no. 4 (2022): 190–205, <https://doi.org/10.56910/pustaka.v2i4.359>.

⁷ Desy Riani Hafshah and Nursiwi Nugraheni, "Dinamika Kesetaraan Pendidikan Sebagai Fondasi SDGs," *Jurnal Penelitian Pendidikan Indonesia (JPPI)* 1, no. 3 SE-Articles (April 1, 2024): 142–50, <https://doi.org/10.62017/jppi.v1i3.989>.

Partnership for 21st Century Skills.⁸ This concept has been widely adopted by various education systems around the world to ensure students are prepared to face the challenges of the 4.0 industrial revolution and socio-cultural changes.⁹ Empirical studies confirm that integrating 4C skills into the curriculum can increase student engagement and support meaningful learning outcomes.¹⁰ At the national level, Indonesia has also integrated the 4C principles through the Merdeka Curriculum, with an emphasis on the Pancasila Student Profile.¹¹ However, the implementation of this curriculum faces challenges in terms of consistency and uniformity of learning quality in the field.^{12,13}

The International Primary Curriculum (IPC) is an innovative curriculum model designed to integrate academic, social, emotional, and sustainability skills through a global thematic approach. The IPC offers a systematic structure with internationally standardized learning units, supporting cross-country benchmarking while allowing for the integration of local contexts.¹⁴ The strength of IPC lies in its ability to facilitate meaningful cross-disciplinary learning, for example in the theme “Active Planet” which combines science, geography, and art.¹⁵ This approach has been proven to increase students’ motivation to learn, critical thinking skills, and analytical abilities regarding real-world issues.¹⁶ Thus, the IPC is considered relevant in bridging the gap between global needs and the local realities of basic education.

A number of studies support the effectiveness of IPC in developing 21st-century skills. In Indonesia, the implementation of IPC has been shown to improve critical thinking skills and student engagement in learning at the elementary school level.¹⁷ In fact, the integration of IPC and the Merdeka Curriculum results in a collaborative learning experience that is more in line with the demands of the 21st century.¹⁸ These findings

⁸ Bernie Trilling and Charles Fadel, *21st Century Skills: Learning for Life in Our Times* (San Fransisco: John Wiley & Sons, Ltd, 2009).

⁹ Rosemarie Hill and Dan Hughes, “Nature Connectedness and The Common Third Within the Primary Curriculum,” in *Exploring Sustainability Through a Cross-Curricular Approach* (Routledge, 2025), 109–21, <https://doi.org/10.4324/9781003506850-11>.

¹⁰ Henrietta Nagy and Admira Boshnyaku, “Measuring Knowledge of Youth About Sustainability and Circular Economy,” *Engineering for Rural Development* 24 (2025): 292–98, <https://doi.org/10.22616/ERDev.2025.24.TF064>.

¹¹ Sri Nopiani et al., “Kompetensi 4C Dalam Implementasi Kurikulum Merdeka Di Kelas IV Sekolah Dasar,” *Didaktik: Jurnal Ilmiah PGSD STKIP Subang* 9, no. 2 (July 7, 2023): 5202–10, <https://doi.org/10.36989/didaktik.v9i2.1136>.

¹² Ermis Suryana et al., “Perkembangan Remaja Menengah Awal Dan Implikasinya,” *Jurnal Ilmiah Mandala Education* 8, no. 3 (2022): 1917–28, <https://doi.org/10.58258/jime.v9i1.3494>.

¹³ Ahmad Ahmad, “Perencanaan Pendidikan Yang Responsif Terhadap Perubahan Sosial: Pendekatan Inklusif Untuk Mewujudkan Pendidikan Berkualitas,” *Khatulistiwa* 5, no. 2 (2022): 49–61, <https://doi.org/10.69901/kh.v5i2.284>.

¹⁴ Volume Nomor et al., “Implementasi Integrasi Kurikulum IPC (International Primary Curriculum) Dan Merdeka Di SD Nasional Plus Indonesia,” *Edukatif: Jurnal Ilmu Pendidikan* 6, no. 1 (2024): 220–31, <https://doi.org/10.31004/edukatif.v6i1.5875>.

¹⁵ Kristanto Adi Nugroho, Agus Kristiyanto, and Muchsin Doewes, “Implementasi Pendidikan Jasmani Dalam International Primary Curriculum,” *Jurnal Keolahragaan* 6, no. 2 (September 22, 2018): 110–19, <https://doi.org/10.21831/jk.v0i0.21336>.

¹⁶ Yatha Yuni, Les Tia Hanifa, and Hegar Harini, “Pengembangan Proses Pembelajaran Berbasis Pendidikan Karakter Di Kelas,” *Jurnal Citizenship Virtues* 4, no. 1 (2024): 713–23, <https://doi.org/10.37640/jcv.v4i1.1971>.

¹⁷ Chionia Karesi Putri and Gregorius Ari Nugrahanta, “Upaya IPC Dalam Menunjang Keterampilan Berpikir Kritis Bagi Siswa Kelas 2 SD,” *Metodik Didaktik* 20, no. 1 (2024): 35–44, <https://doi.org/10.17509/md.v20i1.58961>.

¹⁸ Nomor et al., “Implementasi Integrasi Kurikulum IPC (International Primary Curriculum) Dan Merdeka Di SD Nasional Plus Indonesia.”

indicate that IPC can be a strategic alternative in supporting basic education transformation.

However, previous studies have also highlighted a number of limitations. First, many studies focus on the integration of SDGs and sustainability in higher education, while research on implementation in primary education is still limited.¹⁹ Second, although the literature shows the potential for integrating sustainability-based curricula, most studies emphasize practical implementation challenges, such as limitations in teacher training, facilities, and adaptation to local contexts.^{20,21} Third, studies on international curricula such as IPC often focus on conceptual aspects, without discussing in depth their contribution to the SDGs at the elementary school level.^{22,23} This research gap underscores the need for more comprehensive exploration of the contribution of IPC in supporting 21st-century education and the global sustainability agenda.

Based on this context, this study aims to analyze the implementation of the IPC Curriculum in supporting 21st-century education, particularly the integration of critical thinking, creativity, communication, and collaboration (4C) skills. In addition, this study evaluates the contribution of IPC to the achievement of the Sustainable Development Goals (SDGs), especially Goal 4: Quality Education. This study also offers a contextual perspective on how IPC can be adapted for elementary education in Indonesia, taking into account the integration of local cultural values. This research is expected to not only enrich the literature on international curricula, but also provide practical recommendations for more responsive, inclusive, and sustainable basic education reform. Thus, this study has the potential to become an important reference in the global discourse on 21st-century curriculum innovation.

2. Method

This study uses a Systematic Literature Review (SLR) approach designed to synthesize empirical evidence on the implementation of the IPC Curriculum in the development of 21st-century skills and its contribution to the achievement of SDG 4. The SLR method was chosen because it provides a structured framework for identifying, selecting, and synthesizing relevant studies and reduces selection bias through standardized procedures. The reporting of the review process follows the PRISMA principles to ensure transparency in the identification, screening, eligibility, and inclusion stages so that the results can be replicated and audited. Thus, this methodology supports the achievement of research objectives in a systematic and evidence-based manner.

A systematic literature search was conducted in the Scopus and Google Scholar databases, as well as using the Publish or Perish tool to extract citations from Google Scholar, using a combination of the keywords “International Primary Curriculum,” “21st

¹⁹ Luis Espino-Díaz et al., “Exploring the Impact of Project-Based Learning on Sustainable Development Goals Awareness and University Students’ Growth,” *European Journal of Educational Research* 14 (January 8, 2025): 283–96, <https://doi.org/10.12973/eu-jer.14.1.283>.

²⁰ Ángel Alsina and Claudia Vásquez, “Professional Development and Teacher Agency in Mathematics Teacher Education for Sustainability,” *Mathematics Education Research Journal* 37, no. 2 (2025): 215–38, <https://doi.org/10.1007/s13394-024-00488-y>.

²¹ Salvador Boned-Gomez, “Education for Sustainability: Analysing the Spanish Curriculum in Primary Education and Physical Education,” 2025, <https://doi.org/10.1080/25742981.2025.2466543>.

²² Yvonne Yu-Feng Liu, “Taiwan: Towards Comprehensive Integration: Early Childhood Education for Sustainability in Taiwan,” in *International Perspectives on Early Childhood Education and Development* (Springer Science and Business Media B.V, 2025), 211–25.

²³ Paloma Bravo-Fuentes, María Paz López-Peláez Casellas, and Miriam Albusac-Jorge, “Music and Art as a Hubs for Transdisciplinarity: Toward the Achievement of the Sustainable Development Goals,” *Arts Education Policy Review* 4, no. 1 (2025): 1–9, <https://doi.org/10.1080/10632913.2025.2451372>.

Century Education,” and “Sustainable Development Goals.” The search was limited to publications in Indonesian or English in the range of 2020–2025 to ensure contemporary relevance. Article selection was conducted in two stages, namely initial screening based on titles and abstracts and full-text assessment to evaluate suitability with the inclusion criteria. From the initial search results, 20 articles met all inclusion criteria and were selected for analysis. All inclusion and exclusion decisions were documented using a PRISMA flow diagram as part of the audit trail.

Data extraction was conducted using a structured form that recorded metadata, research objectives, methodological design, focus on 4C skills, IPC implementation strategies, and contributions to SDG 4. Data analysis was carried out through thematic analysis to identify patterns, main themes, and trends in IPC implementation. The analysis process followed the six phases developed by Braun and Clarke, ranging from data familiarization to theme naming and analytical report writing.²⁴ The results of the analysis were then mapped into a synopsis matrix to facilitate triangulation between articles. In this way, the relationship between IPC implementation strategies, 21st-century skills development, and SDG 4 indicators could be comprehensively evaluated.

The reliability of the research is maintained through the involvement of at least two independent researchers in the screening and data extraction stages, where differences in assessment results are resolved through discussion and methodological consensus. Internal validity is strengthened through explicit inclusion criteria, PRISMA flow documentation, and audit trail recording that includes selection decisions and thematic coding. Potential publication bias and language limitations are anticipated through the use of more than one database and strict screening procedures. All methodological documentation is stored to enable external verification and replication of the study. With these measures, the study is positioned to have strong reliability and validity, so that the results are scientifically accountable.

3. Results

In accordance with the qualitative research design based on Conceptual Framework Development,²⁵ the primary result presented is not empirical data, but rather a comprehensive conceptual model. This model is the product of argumentative analysis and thematic synthesis of foundational literature. The process aims to “ground” the principles of Meaningful, Mindful, and Joyful Learning into the unique context of Arabic language instruction in madrasahs by bridging modern psychological ideas with Islamic pedagogical wisdom.

The analysis is presented in two main stages. First, a thematic synthesis that dissects, integrates, and reinterprets the study's three main pillars: (1) Meaningful Learning, (2) Mindful Learning, and (3) Joyful Learning. Second, the construction of the “Arabic Language Learning as a Holistic Experience” conceptual framework as the theoretical proposition resulting from this synthesis.

3.1. The Impact of Implementing the International Primary Curriculum on 21st-Century Education

The IPC (International Primary Curriculum) contributes significantly to the development of 21st-century skills, which include critical thinking, creativity, communication, and collaboration (4Cs), through a thematic, cross-disciplinary, and exploration-based curriculum design. This significant contribution to the development of 21st-century skills

²⁴ Virginia Braun and Victoria Clarke, *Thematic Analysis: A Practical Guide* (Sage Publications, 2021).

²⁵ Matthew B Miles, A Michael Huberman, and Johnny Saldaña, *Qualitative Data Analysis: A Methods Sourcebook*, 3rd ed. (Sage Publications, 2014).

can be seen in each IPC unit, which is developed with explicit learning objectives related to the 4Cs and equipped with activities that encourage students to solve problems, work in teams, convey ideas orally and in writing, and produce creative products. Chionia's research explains that IPC is more capable of improving critical thinking skills through the integration of learning design, learning processes, and learning assessment compared to conventional curricula.²⁶ The implementation of learning with systematic and theme-based materials and curriculum that are global yet contextual has proven to be effective in improving students' understanding of the interrelationships between disciplines.²⁷

This interdisciplinary approach not only focuses on academic aspects, but also encourages students to address real issues, such as environmental sustainability, social inequality, and the impact of global change.²⁸ Karin's study proves that a cross-disciplinary approach has a positive impact in encouraging students to address real issues such as environmental sustainability, social inequality, and global change. By combining various fields of study, students can develop the systemic, reflective, and critical thinking skills that are essential for understanding and finding solutions to these complex problems.²⁹

The interdisciplinary approach in the IPC (International Primary Curriculum) has advantages over the traditional approach of teaching subjects separately. In an interdisciplinary approach, students do not just learn fragmented facts, but are encouraged to see the connections between concepts in a holistic and meaningful thematic context. This encourages them to develop critical thinking skills, solve problems in an integrated manner, and understand the connections between science and real life.

Several studies show that students who learn through an interdisciplinary approach demonstrate higher learning engagement, deeper conceptual understanding, and better knowledge transfer skills. For example, research by Drake & Reid found that interdisciplinary learning can improve information retention and student motivation because the material is presented in an interrelated context. Conversely, the traditional fragmented approach often makes it difficult for students to relate what they learn to real-world situations, as each subject is taught separately without bridges between disciplines. Therefore, interdisciplinary approaches such as those implemented in IPC are considered more effective in preparing students for the complexities of the 21st century, which demands knowledge integration rather than merely mastery of separate content.

The application of project-based learning methods in the IPC (International Primary Curriculum) also enables students to learn collaboratively and innovatively. For example, in the theme Our Sustainable World, students are invited to explore solutions to environmental problems around them, such as waste management and water conservation. These activities not only build practical skills, but also instill a sense of responsibility and empathy in students towards the environment.³⁰ These activities

²⁶ Putri and Nugrahanta, "Upaya IPC Dalam Menunjang Keterampilan Berpikir Kritis Bagi Siswa Kelas 2 SD."

²⁷ Nomor et al., "Implementasi Integrasi Kurikulum IPC (International Primary Curriculum) Dan Merdeka Di SD Nasional Plus Indonesia."

²⁸ Putri and Nugrahanta, "Upaya IPC Dalam Menunjang Keterampilan Berpikir Kritis Bagi Siswa Kelas 2 SD."

²⁹ Karin Alm, Maria Melén, and Caroline Aggestam-Pontoppidan, "Advancing SDG Competencies in Higher Education: Exploring an Interdisciplinary Pedagogical Approach," *International Journal of Sustainability in Higher Education* 22, no. 6 (July 26, 2021): 1450–66, <https://doi.org/10.1108/IJSHE-10-2020-0417>.

³⁰ Ahmad Subair, "Sejarah Pendidikan Indonesia: Sebuah Refleksi," *JICN: Jurnal Intelek Dan Cendekiawan Nusantara* 1, no. 5 (2024): 6395–6394, <https://jicnusantara.com/index.php/jicn>.

provide a deep learning experience, encouraging students to understand the impact of their actions on society and the environment. This project-based approach provides space for students to actively participate in the learning process, thereby creating a more meaningful and contextual learning experience. This is one of the factors that encourages increased student engagement and enthusiasm in the classroom.

In addition, case studies in various schools that have implemented the International Primary Curriculum (IPC) show that student engagement in learning has increased significantly. Students are more enthusiastic about learning because the material taught is relevant to their daily lives. For example, in the Active Planet theme, students learn about natural disasters through simulations that involve various roles, such as scientists, journalists, and rescuers. This activity improves their understanding of the importance of disaster mitigation while strengthening their communication skills.³¹ Furthermore, the IPC (International Primary Curriculum) helps students develop a global mindset without forgetting their local context. This is an important advantage, especially in today's interconnected world. Through themes such as Living Together, students are encouraged to understand cultural differences, build tolerance, and practice cooperation in cross-cultural groups. This supports the integration of human values that are an important foundation for inclusive global development.

3.2. The Contribution of the International Primary Curriculum in Achieving the SDGs, Specifically Goal 4

The IPC (International Primary Curriculum) directly supports the achievement of Goal 4: Quality Education in the SDGs. With an inclusive approach, this curriculum provides space for all students, including those with special needs, to actively participate in learning. This is in line with the principle of leaving no one behind, which is the basis of the SDGs.³²

The implementation of the IPC (International Primary Curriculum) can reduce educational disparities between regions. The flexibility of this curriculum allows for adaptation to local needs, making it relevant for implementation in both rural and urban areas and adaptable to life skills.³³ The integration of sustainability values is one of the key elements of the IPC (International Primary Curriculum). With themes such as Saving the Planet, students not only learn about the importance of conservation, but are also trained to become agents of change in their communities. This creates a double impact, namely an increase in students' environmental literacy and a strengthening of public awareness of sustainability.³⁴ Student involvement in community projects such as this also enhances their capacity as socially responsible young leaders.

In addition, the thematic approach in the IPC (International Primary Curriculum) supports the achievement of other SDGs such as reducing inequality (Goal 10) and taking action against climate change (Goal 13). Students are taught to understand global challenges through a local perspective, thereby creating awareness of the importance of sustainable solutions.

3.3. The Implementation of International Primary Curriculum in Indonesia

³¹ Desy Riani Hafshah and Nursiwi Nugraheni, "Dinamika Kesenjangan Pendidikan Sebagai Fondasi SDGs."

³² Armida Salsiah Alisjahbana and Endah Murniningtyas, *Tujuan Pembangunan Berkelanjutan Di Indonesia: Konsep Target Dan Strategi Implementasi* (Bandung: UNPAD Press, 2018).

³³ Leni Layyinah, "Menciptakan Pembelajaran Fun Learning Based on Scientific Approach Dalam Pembentukan Karakter Peserta Didik Pada Pembelajaran PAI," *TARBAWY: Indonesian Journal of Islamic Education* 4, no. 1 (2017): 1–9, <https://doi.org/10.17509/t.v4i1.6987>.

³⁴ Nomor et al., "Implementasi Integrasi Kurikulum IPC (International Primary Curriculum) Dan Merdeka Di SD Nasional Plus Indonesia."

Despite its great potential, the implementation of the International Primary Curriculum (IPC) in Indonesia faces a number of challenges. One of these is limited educational infrastructure, especially in remote areas. Many schools in rural areas do not yet have facilities such as laboratories, adequate classrooms, or access to digital technology, which are essential for supporting project-based learning methods.³⁵

Teacher readiness is a key factor in the success of the International Primary Curriculum (IPC). Implementing this curriculum requires teachers who are able to integrate various disciplines and use innovative learning methods. However, training for teachers in Indonesia is still uneven, especially in remote areas. This hinders the effective implementation of the International Primary Curriculum (IPC).³⁶ Without ongoing training support, teachers may find it difficult to manage learning that involves many interdisciplinary components. Another challenge is adapting the global curriculum to the local context. The global themes promoted by the International Primary Curriculum (IPC) are sometimes less relevant to the local reality in some areas. Therefore, efforts are needed to integrate local cultural values into the curriculum without reducing its global essence.³⁷

In addition, procuring learning resources that meet IPC (International Primary Curriculum) standards requires significant investment. Many schools face obstacles in providing teaching materials, teaching aids, and supporting technology. Inequality in access to these resources can widen the gap in education quality between developed and underdeveloped regions.

Based on the results of the study, a number of strategic recommendations were proposed to support the optimization of the implementation of the International Primary Curriculum (IPC) in Indonesia. First, improving teacher capacity is a top priority. Ongoing training is needed to equip teachers with the skills to apply project-based learning methods, manage interdisciplinary themes, and use an inclusive approach. In addition, the formation of a teacher learning community can be a forum for sharing best practices, thereby strengthening the collective capacity of teachers in facing the challenges of implementing the IPC (International Primary Curriculum).³⁸

Second, strengthening educational infrastructure is crucial to support the implementation of the International Primary Curriculum (IPC), especially in disadvantaged areas. Special budget allocations should focus on developing adequate educational facilities, including proper classrooms, laboratories, and access to digital technology. Digital technology, such as online learning platforms, can also be utilized to bridge the resource gap in remote areas, so that students throughout Indonesia have equal access to learning.

Third, adapting the curriculum is a strategic step to ensure the relevance of the IPC (International Primary Curriculum) to the local context.³⁹ This adaptation process requires the involvement of community leaders and cultural experts to integrate local values into the global themes promoted by IPC (International Primary Curriculum). The development of supplementary learning materials that reflect local culture is also

³⁵ Anas, Wahyudi, and Apsari, "Desa Dan Kota Dalam Potret Pendidikan."

³⁶ Lisdaleni et al., "Problematika Pendidikan Islam Di Pesantren Dan Madrasah Di Era Globalisasi."

³⁷ Desy Riani Hafshah and Nursiwi Nugraheni, "Dinamika Kesenjangan Pendidikan Sebagai Fondasi SDGs."

³⁸ Subair, "Sejarah Pendidikan Indonesia: Sebuah Refleksi."

³⁹ Fachrurizal Bachrul Ulum, "Implementation of an Integrative Curriculum in Kindy Afkaaruna Islamic School and Its Relevance To the Attitude of Religious Moderation," *Shibghoh: Prosiding Ilmu Kependidikan UNIDA Gontor* 2, no. 2 (2023): 420, <https://ejournal.unida.gontor.ac.id/index.php/shibghoh/article/view/11049>.

necessary to maintain a balance between global perspectives and students' local identities. With this approach, students not only understand global issues but also appreciate and preserve their own cultures and traditions.

Fourth, collaboration among stakeholders is a key element in supporting the sustainability of IPC (International Primary Curriculum) implementation. The government, educational institutions, the private sector, and non-governmental organizations need to collaborate to provide resources, training, and logistical support for schools adopting the IPC (International Primary Curriculum). Additionally, the local community should also be involved to support student learning projects, so that project-based learning can reflect the real needs and challenges in their environment.⁴⁰

Fifth, monitoring and evaluation are necessary to ensure the effectiveness of the IPC (International Primary Curriculum) implementation. A standardized monitoring system should be developed to evaluate the extent to which this curriculum achieves the expected goals.⁴¹ Periodic research is also needed to identify emerging barriers and opportunities during the implementation of the International Primary Curriculum (IPC), so that continuous improvement strategies can be implemented. Monitoring and evaluation reports must be submitted to stakeholders to ensure transparency and accountability in the IPC implementation process.

In the long run, optimal implementation of the IPC (International Primary Curriculum) is expected to create a young generation with 21st-century skills and global and local awareness. Students involved in this curriculum will not only be prepared to compete in the international job market but will also have a high level of concern for social and environmental issues in their communities. With skills like critical thinking, collaboration, and creativity, students will become innovators capable of tackling global challenges and providing relevant solutions.

The IPC (International Primary Curriculum) has the potential to create an inclusive and sustainable educational ecosystem thru its flexible, globally-oriented, and locally responsive curriculum design. The thematic and interdisciplinary approach of the IPC allows teachers to tailor learning to the diverse needs of students, including those from different cultural, linguistic, and ability backgrounds. Additionally, the IPC explicitly encourages community involvement in the learning process thru collaborative projects and local exploration, which strengthens the relationship between schools, families, and the wider community.

The implementation of the International Primary Curriculum (IPC) in countries other than Indonesia generally adapts to the local context, student needs, and local education policies. In various countries, the IPC is implemented to strengthen interdisciplinary learning, character development, and 21st-century skills such as critical thinking and collaboration. International schools outside of Indonesia typically adapt the IPC by integrating local values and community needs, as well as adjusting evaluation methods and teacher training to align with international standards. Additionally, IPC is often combined with the national curriculum or other curricula such as the Cambridge International Primary Program, providing students with a holistic and globally relevant

⁴⁰ Lisdaleni et al., "Problematisasi Pendidikan Islam Di Pesantren Dan Madrasah Di Era Globalisasi."

⁴¹ Dendodi et al., "Dampak Dan Tantangan Terhadap Transformasi Kurikulum Di Satuan Pendidikan."

learning experience.⁴² This approach aims for students to not only excel academically, but also possess strong character and life skills.⁴³

4. Discussion

This research aims to analyze the implementation of the IPC (International Primary Curriculum) in supporting 21st-century skills (4Cs) and its contribution to achieving the SDGs, particularly Goal 4: Quality Education. The findings indicate that IPC is capable of strengthening critical, creative, communicative, and collaborative dimensions thru a cross-disciplinary approach and contextual project-based learning. Previous studies have emphasized that cross-curricular learning enhances students' knowledge retention and learning motivation because the material is taught in an integrated manner.⁴⁴ This approach is also aligned with sustainable education practices in elementary schools, where the interconnectedness of subjects strengthens students' ability to address global issues.⁴⁵ Thus, this research aims to fill the literature gap regarding the effectiveness of IPC in integrating 21st-century skills and the SDGs agenda.

The main findings indicate that the IPC significantly contributes to the development of critical thinking skills, primarily because its curriculum structure emphasizes exploration and reflection. The interdisciplinary approach practiced in IPC has proven to foster deep understanding and the ability to transfer knowledge between fields. This is consistent with research emphasizing the importance of experiential learning in building cross-contextual competencies.⁴⁶ Additionally, applying a global theme that is locally relevant allows students to address real-world issues such as climate change and social inequality, while also raising awareness about sustainability.^{47,48} Thus, IPC facilitates students in developing the systemic skills necessary for solving complex 21st-century problems.

Beside critical thinking, students' creativity also develops thru project-based learning, which allows them to generate innovative solutions to surrounding problems. Thematic activities like "Our Sustainable World" demonstrate how active student involvement can foster a sense of empathy and social responsibility toward the environment.^{49,50} Similar studies have found that project-based learning is effective in improving sustainability literacy, although its effect on attitude change is still limited.⁵¹

⁴² Mukhlisah Mukhlisah and Ni'matus Sholihah, "Implementation of The Cambridge International Primary Programme on A Mosque-Based Learning Culture," *Nidhomul Haq : Jurnal Manajemen Pendidikan Islam* 9, no. 1 (2024): 165–79, <https://doi.org/10.31538/ndh.v9i1.4448>.

⁴³ Sri Marmoah et al., "Implementation of Independent Curriculum for Elementary Schools in Indonesian Schools Abroad," *Jurnal Penelitian Pendidikan IPA* 10, no. 10 (2024): 7228–35, <https://doi.org/10.29303/jppipa.v10i10.8398>.

⁴⁴ Chia Shih Su, María José Seckel, and Claudia Vásquez, "What Learning Opportunities Does the Chilean Primary Education Curriculum Offer to Train in Sustainability?," *Mathematics Teaching-Research Journal* 14, no. 3 (2022): 108–32.

⁴⁵ Hill and Hughes, "Nature Connectedness and The Common Third Within the Primary Curriculum."

⁴⁶ Nagy and Boshnyaku, "Measuring Knowledge of Youth About Sustainability and Circular Economy."

⁴⁷ Alm, Melén, and Aggestam-Pontoppidan, "Advancing SDG Competencies in Higher Education: Exploring an Interdisciplinary Pedagogical Approach."

⁴⁸ Al Husban, "The Impact of Integrating Sustainable Development Goals on Students' Awareness and Pro-Environmental Behavior: A Case Study of Jordan."

⁴⁹ Subair, "Sejarah Pendidikan Indonesia: Sebuah Refleksi."

⁵⁰ Fernando Escobedo et al., "Effect of Health Education on Environmental Pollution as a Primary Factor in Sustainable Development," *Natural and Engineering Sciences* 9, no. 2 (2024): 460–71, <https://doi.org/10.28978/nesciences.1574456>.

⁵¹ Espino-Díaz et al., "Exploring the Impact of Project-Based Learning on Sustainable Development Goals Awareness and University Students' Growth."

Contextual experiences like this are also in line with the service learning approach, which has been proven to strengthen sustainability competencies thru community interaction.⁵² Thus, the creativity developed thru IPC is not only academic but also has social and environmental relevance.

Other results showed that IPC fostered stronger communication and collaboration among students thru group work, role-playing, and cross-cultural discussions. This finding is consistent with the literature showing that social-emotional skills and cross-community cooperation are important pillars in a globally oriented curriculum.⁵³ Students not only learn to convey ideas but also build tolerance for differences, aligning with the human values emphasized in education for sustainability. Activities like the Active Planet theme demonstrate that collaborative simulations enhance understanding of disaster mitigation while strengthening communication skills.⁵⁴ Therefore, IPC has proven to be relevant for building essential interpersonal competencies in the era of globalization.

Compared to previous research, the results of this study support the finding that integrating an international curriculum can strengthen global literacy and students' learning attitudes.⁵⁵ This aligns with international education studies that emphasize the importance of adapting the global curriculum to the local context to create a holistic learning experience.⁵⁶ Additionally, this research confirms that implementing a values-based and sustainability-focused curriculum can foster a global orientation without abandoning local identity.⁵⁷ IPC, with its flexibility, demonstrates that developing global competence does not have to sacrifice local wisdom, but can instead strengthen students' identities amidst the tide of globalization.

However, this study also found challenges consistent with previous studies regarding the limitations of teacher capacity and educational infrastructure in developing countries. Teachers in Indonesia still show limitations in implementing interdisciplinary learning, as was also found in mathematics and sustainability education.⁵⁸ The barriers to educational infrastructure in remote areas are consistent with findings regarding weak access and regulatory support for Community-Based Ecotourism.⁵⁹ Additionally, the challenge of adapting global themes to the local context underscores the importance of value- and culture-based pedagogical strategies to avoid content mismatching with

⁵² Anabela Durão, Teresa Borralho, and Albertina Raposo, "Healthy Campus: A Contribution to the Environment, Sustainability, and Social Responsibility Practices at the IPBeja in Portugal," *Sustainability* 17, no. 3 (2025), <https://doi.org/10.3390/su17030862>.

⁵³ Ana Maria Cristóvão et al., "Emotional Education for Sustainable Development: A Curriculum Analysis of Teacher Training in Portugal and Spain," *Frontiers in Education* 8 (2023), <https://doi.org/10.3389/educ.2023.1165319>.

⁵⁴ Desy Riani Hafshah and Nursiwi Nugraheni, "Dinamika Kesetaraan Pendidikan Sebagai Fondasi SDGS."

⁵⁵ Kai-Chao Yao, Fan-Lung Tseng, and Chi-Chi Chan, "Transforming Education: The Impact of Integrating International Education into School Curricula on International Literacy and Learning Attitudes," *Sustainability* 17, no. 10 (2025), <https://doi.org/10.3390/su17104462>.

⁵⁶ Marmoah et al., "Implementation of Independent Curriculum for Elementary Schools in Indonesian Schools Abroad."

⁵⁷ Yun Ting Huang, "Moderating Role of Self-Efficacy: An Academic Emotion Cost Model," *Bulletin of Educational Psychology* 55, no. 3 (2024): 607–28, [https://doi.org/10.6251/BEP.202403_55\(3\).0008](https://doi.org/10.6251/BEP.202403_55(3).0008).

⁵⁸ Alsina and Vásquez, "Professional Development and Teacher Agency in Mathematics Teacher Education for Sustainability."

⁵⁹ Nawari et al., "Community Based Ecotourism Management to Strengthen Environmental Ethics and Supports Sustainable Development in Pelalawan District, Indonesia," in *IOP Conference Series: Earth and Environmental Science*, vol. 1041 (IOP Publishing, 2022), 12036, <https://doi.org/10.1088/1755-1315/1041/1/012036>.

students' realities.⁶⁰ Thus, the implementation of IPC in Indonesia requires systematic intervention in the aspects of teacher capacity, infrastructure, and curriculum adaptation.

The findings of this study can be explained thru the theoretical framework that interdisciplinary and project-based learning is indeed more effective in building complex competencies because it connects content with real-world experiences. This is supported by literature emphasizing that transdisciplinary curricula such as art and music are capable of expanding the dimensions of sustainable learning.⁶¹ The significance of this finding lies in its relevance to supporting the SDGs thru basic education, particularly by integrating environmental, social, and emotional literacy.⁶² However, the interpretation of these results needs to be done with caution, considering the limitations of the research, which is still within the scope of a case study and the variation in implementation contexts between schools. Therefore, generalizing the results must be done while considering the differences in the characteristics of educational institutions and resource readiness.

The implications of this research are quite extensive for both education policy and practice in Indonesia. From a policy perspective, integrating the IPC can serve as a contextual international curriculum model to strengthen 21st-century skills while supporting the achievement of the SDGs.⁶³ From a practical standpoint, these results confirm the need for continuous training for teachers to enable them to manage cross-disciplinary and project-based learning.⁶⁴ Additionally, local adaptation of IPC is important to ensure content relevance to community cultural values and needs.⁶⁵ With the right implementation strategy, IPC not only improves the quality of basic education but also shapes a generation capable of facing global challenges with a strong local perspective.

5. Conclusion

This research aims to analyze the implementation of the International Primary Curriculum (IPC) in supporting 21st-century education, specifically the strengthening of 4C skills (critical thinking, creativity, communication, collaboration), and its contribution to achieving the SDGs, particularly Goal 4: Quality Education, by providing strategic recommendations for the Indonesian context. The research findings indicate that the IPC significantly enhances 4C skills thru a thematic, interdisciplinary, and project-based approach that fosters student engagement, deep conceptual understanding, and improved knowledge transfer compared to traditional curricula, while also supporting inclusive and contextual learning. The implications of these findings include the potential of IPC as a relevant international curriculum model for Indonesian basic education policy,

⁶⁰ Desy Riani Hafshah and Nursiwi Nugraheni, "Dinamika Kesenjangan Pendidikan Sebagai Fondasi SDGs."

⁶¹ Bravo-Fuentes, Casellas, and Albusac-Jorge, "Music and Art as a Hubs for Transdisciplinarity: Toward the Achievement of the Sustainable Development Goals."

⁶² Najihath Basheer et al., "Exploring Sustainability Assessment Practices in Higher Education: A Comprehensive Review through Content and Bibliometric Analyses," *Sustainability* 16, no. 13 (2024), <https://doi.org/10.3390/su16135799>.

⁶³ R C Agrawal and Seema Jaggi, "Transforming Agricultural Education for a Sustainable Future," in *Transformation of Agri-Food Systems*, ed. K C Bansal, W S Lakra, and Himanshu Pathak (Singapore: Springer Nature Singapore, 2023), 357–69, https://doi.org/10.1007/978-981-99-8014-7_25.

⁶⁴ Esther García-González et al., "Transformative Education for Sustainable Consumption," *Trends in Higher Education* 1, no. 1 (2022): 1–15, <https://doi.org/10.3390/higheredu1010001>.

⁶⁵ Christian Moro, Charlotte Phelps, and Michelle McLean, "Don't Forget the Veggies! Identifying and Addressing a Lack of Vegetable Education in Physiology.," *Advances in Physiology Education* 47, no. 4 (December 2023): 726–31, <https://doi.org/10.1152/advan.00052.2023>.

with an emphasis on teacher capacity building, integration of local cultural values, and implementation strategies that balance global orientation with national identity. However, the limitations of this study lie in the disparities in infrastructure, teacher competence, and resources across different regions, as well as the still conceptual focus of the study, which does not fully capture the dynamics of implementation in the field. Therefore, further research is recommended to conduct comprehensive field studies, longitudinal evaluations of student learning outcomes, and explore the effectiveness of teacher training programs so that IPC can be optimized as an adaptive, globally competitive curriculum model that contributes to sustainable development.

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