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Readiness and Challenges of Pancasila Education Teachers in Implementing Digitally-Enhanced Deep Learning: Toward Achieving SDG 4

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ABSTRACT

Digitally enhanced deep learning has potential to strengthen Pancasila Education by promoting critical reflection, collaboration, and value-based action while supporting Sustainable Development Goal 4 (SDG 4) on quality education. This study examined the readiness and challenges of junior high school Pancasila Education teachers in implementing digitally enhanced deep learning in Magetan Regency, Indonesia. A qualitative descriptive case study was conducted from June to August 2025 involving 26 Pancasila Education teachers selected through purposive sampling from the subject-teacher association. Data were collected through in-depth interviews, structured observations, and documentation. The data were analyzed through reduction, thematic presentation, and conclusion drawing, with triangulation used to strengthen credibility. The findings indicate that teachers showed relatively high readiness in facilitating student collaboration (88.4%), encouraging student participation (84.6%), using digital technology (80.7%), and promoting critical and analytical thinking (80.7%). Moderate readiness was found in the use of reflective questions (76.9%) and case-based learning (73.0%). The lowest readiness appeared in project-based assessment (65.3%). Key challenges included limited digital pedagogical training, inadequate infrastructure and internet access, limited experience in designing authentic assessment rubrics, time constraints, administrative workload, and low student motivation. The study suggests that digitally enhanced deep learning can support more inclusive, meaningful, and student-centered Pancasila Education when accompanied by systematic teacher development. Strengthening teachers' competence in authentic assessment, digital pedagogy, learning management systems, and technology-supported formative feedback is essential for improving implementation quality and advancing SDG 4.

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1. INTRODUCTION

Pancasila Education has a strategic role in shaping Indonesian students' civic character, national identity, democratic awareness, tolerance, and social responsibility. As a compulsory subject in Indonesian schools, Pancasila Education is not only intended to transmit civic knowledge but also to develop students' capacity to interpret, internalize, and practice Pancasila values in everyday life. In the context of contemporary education, this subject needs to move beyond memorization of principles and normative concepts toward learning experiences that encourage students to think critically, reflect ethically, collaborate with others, and respond responsibly to real social issues (Sukmawan, 2022; Wiratomo et al., 2025).

The transformation of the curriculum and the growing use of digital technology have created new demands for Pancasila Education teachers. The Merdeka Curriculum emphasizes student-centered learning, contextual learning, collaboration, and the development of competencies relevant to twenty-first-century life. These demands are closely aligned with the principles of deep learning, which focus on meaningful understanding, critical inquiry, reflection, problem solving, creativity, collaboration, and the transfer of knowledge to real-life situations (Fullan et al., 2017; Thornhill-Miller et al., 2023). Therefore, Pancasila Education teachers are expected to design learning activities that enable students to connect civic values with authentic social problems such as intolerance, inequality, discrimination, digital citizenship, and community participation.

In this study, digitally-enhanced deep learning is used as the main and consistent term. Operationally, digitally-enhanced deep learning in Pancasila Education refers to a pedagogical approach in which teachers integrate digital technology with reflective, collaborative, problem-based, and value-oriented learning activities to help students understand, analyze, and apply Pancasila values in authentic contexts. This approach involves several observable practices: the use of digital media and online resources to explore civic issues; case-based and project-based learning to connect Pancasila values with real-life situations; collaborative discussion to strengthen democratic communication; reflective questioning to deepen moral and civic reasoning; and authentic assessment to evaluate students' critical thinking, participation, collaboration, and value-based actions. Thus, the term does not merely refer to the technical use of digital tools, but to the purposeful integration of technology, pedagogy, and civic content to support deeper learning outcomes.

The concept of digitally-enhanced deep learning is also relevant to the Technological Pedagogical and Content Knowledge framework. Effective digital integration requires teachers to combine knowledge of technology, pedagogy, and subject matter so that digital tools are used meaningfully rather than superficially (Mishra & Koehler, 2006). In Pancasila Education, this means that teachers must be able to select digital resources, design participatory learning strategies, and guide students in interpreting civic values ethically and critically. For example, videos, online news, digital discussion boards, learning management systems, and collaborative platforms can support students' exploration of social issues, but their effectiveness depends on teachers' ability to frame these resources through critical questions, reflective dialogue, and authentic tasks.

Digitally-enhanced deep learning also supports the achievement of Sustainable Development Goal 4, which emphasizes inclusive, equitable, and quality education as well as lifelong learning opportunities for all. Quality education is not limited to access to schooling, but also concerns the relevance, inclusiveness, and transformative quality of learning experiences (Unterhalter, 2019). In this regard, Pancasila Education can contribute to SDG 4 by fostering students' civic literacy, ethical awareness, respect for diversity, critical thinking, and social participation. However, this contribution requires teachers who are prepared to implement learning that is mindful of student diversity, meaningful in relation to students' lived experiences, and joyful enough to promote motivation and active engagement (Feriyanto & Anjariyah, 2024; Mubarok et al., 2024).

Despite its potential, the implementation of digitally-enhanced deep learning remains challenging. Previous studies indicate that many teachers still face difficulties in integrating digital technology into pedagogically meaningful learning designs. These challenges include limited digital literacy, lack of

professional training, inadequate infrastructure, limited internet access, time constraints, administrative workload, and difficulties in designing authentic and project-based assessments (Atmojo et al., 2025; Marwa et al., 2024; Pangesti et al., 2025). In Pancasila Education, these challenges are more complex because teachers are not only required to master digital tools but also to ensure that technology supports ethical reflection, civic responsibility, and the internalization of national values.

Several studies have discussed teacher readiness for digital technology and curriculum innovation, yet much of the existing research focuses on general technological competence or the use of learning applications. Fewer studies have specifically examined how Pancasila Education teachers are prepared to implement digitally-enhanced deep learning that integrates digital pedagogy, civic content, reflective inquiry, collaboration, and authentic assessment. This gap is important because the success of deep learning in Pancasila Education depends on teachers' readiness to design transformative learning experiences that connect values with real-life civic practices.

Based on this background, the present study aims to examine the readiness and challenges of junior high school Pancasila Education teachers in implementing digitally-enhanced deep learning to support the achievement of SDG 4. Specifically, this study explores teachers' readiness in facilitating student participation, collaboration, digital technology use, reflective questioning, case-based learning, critical and analytical thinking, and project-based assessment. The findings are expected to provide empirical insights for teacher professional development, school-level support, and education policy aimed at strengthening the quality of Pancasila Education in the digital era.

2. METHODS

This study employed a qualitative descriptive design with a case study approach to explore the readiness and challenges of Pancasila Education teachers in implementing digitally-enhanced deep learning at the junior high school level. This design was selected because the study aimed to obtain a contextual and in-depth understanding of teachers' experiences, perceptions, practices, and obstacles in integrating digital technology with deep learning principles in Pancasila Education. Although the study was primarily qualitative, descriptive percentages were used to summarize teachers' readiness across several observed indicators.

The study was conducted in junior high schools in Magetan Regency, Indonesia, from June to August 2025. The participants were 26 Pancasila Education teachers who were members of the subject-teacher association at the junior high school level. Based on the participant data, their teaching experience ranged from 3 to 9 years. Six teachers had 3 years of experience, one teacher had 4 years, seven teachers had 5 years, three teachers had 6 years, four teachers had 7 years, two teachers had 8 years, and three teachers had 9 years (see Table 1). In terms of digital competency, 19 teachers reported having experience using digital technology in learning, six teachers reported limited experience, and one participant had incomplete information on this aspect. These characteristics indicate that the participants represented teachers with varied teaching experience and different levels of digital readiness.

Participants were selected using purposive sampling. The selection criteria were:

1. teachers who actively taught Pancasila Education at the junior high school level;
2. teachers who were members of the Pancasila Education teacher association in Magetan Regency;
3. teachers who had experience using, or attempting to use, digital technology in classroom instruction;
4. teachers who were involved in Merdeka Curriculum implementation; and
5. teachers who were willing to participate in interviews, observations, and documentation review.

These criteria were used to ensure that the selected participants had relevant experience with the research focus.

Data were collected through semi-structured interviews, structured observations, and documentation. The interview guide covered several main areas: teachers' understanding of digitally-enhanced deep learning, their readiness to design student-centered Pancasila Education lessons, the

use of digital media and platforms, strategies for encouraging collaboration and critical thinking, implementation of reflective and case-based learning, project-based assessment practices, challenges faced in classroom implementation, and support needed for professional development. Interviews were conducted individually to allow teachers to describe their experiences in detail.

Structured observations were conducted to examine how digitally-enhanced deep learning appeared in classroom practice. The observation indicators included student participation, student collaboration, use of reflective questions, use of digital technology, case-based learning, encouragement of critical and analytical thinking, and project-based assessment. Field notes were also taken to record classroom interactions, teacher facilitation strategies, students' responses, availability of infrastructure, and contextual constraints during learning.

Documentation was used to strengthen and verify the interview and observation data. The documents reviewed included lesson plans, teaching modules, student worksheets, digital learning materials, assessment rubrics, classroom activity records, photographs of learning activities, and available evidence of technology use such as learning management systems, online discussion platforms, or digital presentation tools.

Data were analyzed using thematic analysis supported by descriptive quantification. First, interview recordings were transcribed, observation notes were organized, and relevant documents were reviewed. Second, the researchers conducted open coding by identifying meaningful statements related to teacher readiness, digital technology use, collaboration, reflective learning, authentic assessment, infrastructure, training needs, and student motivation. Third, similar codes were grouped into broader categories, such as digital pedagogical readiness, deep learning implementation, assessment readiness, institutional support, and classroom challenges.

Fourth, the categories were developed into major themes, including: teachers' readiness to implement digitally-enhanced deep learning, pedagogical and technological challenges, limitations in project-based assessment, and the relevance of the approach to SDG 4. To summarize readiness levels, each indicator was reviewed using evidence from interviews, observations, and documentation, then converted into descriptive percentages. These percentages were not intended for statistical generalization but to provide a concise overview of readiness patterns among participants.

To ensure trustworthiness, the study used source triangulation by comparing interview findings with observation results and documentary evidence. Member checking was conducted by confirming selected interpretations with several participants. The researchers also discussed coding results to reduce individual bias and ensure consistency in theme development. Ethical procedures were followed by obtaining informed consent, explaining the purpose of the study, ensuring voluntary participation, protecting participants' identities, and using the collected data only for academic purposes.

Table 1. Data on Pancasila Education Teachers at Junior High Schools in *Magetan* Regency

No	Name	School Name	Years of experience	Digital competency
1.	GP	SMPN 1 MAOSPATI	5 years	have experience
2.	AK	SMPN 1 PLAOSAN	3 years	lack of experience
3.	HK	SMPN 2 BARAT	7 years	have experience
4.	F	SMP NEGERI 1 BENDO	6 years	have experience
5.	SN	SMPN 1 LEMBEYAN	5 years	have experience
6.	DR	SMPN 2 MAOSPATI	8 years	have experience
7.	M	SMP N 3 MAOSPATI	5 years	
8.	ES	SMPN 1 TAKERAN	7 years	lack of experience
9.	S	SMPN 1 KARAS	6 years	lack of experience
10.	SF	SMPN 4 MAGETAN	7 years	lack of experience
11.	SD	SMPN 1 KAWEDANAN	8 years	lack of experience
12.	RM	SMP NEGERI 1 PANEKAN	9 years	lack of experience

13.	A	SMPN 3 PLAOSAAN	3 years	have experience
14.	DM	SMPN 2 NGARIBOYO	5 years	have experience
15.	DS	SMPN 2 PONCOL	9 years	have experience
16.	UR	SMP NEGERI 3 MAGETAN	3 years	have experience
17.	DH	SMPN 2 SUKOMORO	5 years	have experience
18.	YS	SMPN 3 MAGETAN	6 years	have experience
19.	ES	SMPN 1 KARANGREJO	3 years	have experience
20.	YN	SMPN 1 PARANG	5 years	have experience
21.	AY	SMPN 1 SUKOMORO	9 years	have experience
22.	SS	SMPN 1 NGUNTORONADI	3 years	have experience
23.	AM	SMPN 1 KARANGREJO	5 years	have experience
24.	LE	SMPN 2 PANEKAN	7 years	have experience
25.	WS	SMPN 1 PONCOL	3 years	have experience
26.	SI	SMP N 3 MAOSPATI	4 years	have experience

Resource: The Researchers

3. FINDINGS AND DISCUSSION

3.1 Findings

3.1.1 Deep Learning Approach in Pancasila Education Subjects

The interview results reveal the teachers' perspectives on implementing deep learning in Pancasila Education. According to teacher informant 1:

"*In my opinion, deep learning is not just about students memorizing the Pancasila principles or values, but how they can connect those values to everyday life. Deep learning encourages students to think critically, analyze social problems, and take action based on Pancasila values*."

Interview results with teachers 2, forms of in-depth learning implementation that have used in teaching Pancasila values:

"*I often use case studies. For example, when discussing the principle of social justice, I give them a case study about economic inequality. Students are asked to analyze the causes and provide solutions based on Pancasila values. They usually discuss in groups and make presentations."*

Interview results with teacher 3, tThe role of digital technology in supporting in-depth learning in this subject:

"Technology is very helpful, especially for searching for information and creating presentations. I sometimes use videos, online news, or Padlet for reflective discussions. With digital, students can more actively seek out references and compare issues. But we still have internet problems at school."

3.1.2 Pancasila Education Teachers' Readiness in the Deep Learning Approach to Achieve SDG 4 (Quality Education)

Interview results with teacher 4: How prepared are you to use digital technology for Pancasila Education learning? G1:

"I feel quite prepared, but not yet fully prepared. I can already use platforms like Google Classroom, YouTube, and Canva. However, when it comes to in-depth learning, such as creating digital projects or simulations, I still have a lot to learn. The challenge is that I don't have much time to practice"

Interview Results with Teacher 5: What is your biggest challenge in integrating deep learning with technology. G1:

" There are two challenges: first, school facilities are still minimal. Internet access is often slow. Second, there is no specific training for Pancasila teachers on how to integrate values with digital technology. So I had to learn on my own"

Interview results with six teachers: Is digital-based immersive learning crucial for achieving SDG 4?

G2:

"Yes, it's very important. SDG 4 emphasizes the quality of education. With digital immersive learning, students not only understand the values of Pancasila but are able to apply them to real-world issues. However, its implementation requires policy support and teacher competence."

In the deep learning approach, the application of the principles of mindful (i.e., valuing student diversity), meaningful (i.e., connecting learning to real-world contexts), and joyful (i.e., creating positive learning experiences) aligned with SDG 4 (Quality Education) to reduce disparities and inequalities in education access and quality. These principles are key to helping vulnerable populations such as poor, remote, disabled, indigenous, and refugee children.

In this regard, Pancasila Education teachers who are ready to implement deep learning serve as academic facilitators and agents of change. Our study showed the readiness of Pancasila Education teachers in junior high schools in *Magetan* Regency to implement the deep learning approach (see Table 2).

Table 2. Percentage of Teachers' Readiness in Implementing Deep Learning

Deep Learning Implementation Indicators	Percentage of Teacher Readiness
Student participation	84.6%
The use of reflective questions	76.9%
The use of digital technology	80.7%
The use of project-based assessments	65.3%
Students' collaboration	88.4%
The use of case-based learning	73.0%
Encouragement of critical and analytical thinking	80.7%

Resource: The Researchers

The data on teacher readiness in implementing deep learning showed that most indicators were in the high category. The highest readiness was found in Students' collaboration at 88.4%. Teachers had optimally facilitated group work as an essential part of meaningful learning. Moreover, student participation also ranked high at 84.6%, indicating that learning was moving towards a student-centered approach. Furthermore, using digital technology and encouraging critical and analytical thinking reached 80.7%. They noted that teachers utilized technology and learning strategies to improve students' analytical skills. Reflective questions (76.9%) and case-based learning (73.0%) indicated a relatively good level of preparedness. However, further empowerment is needed to ensure a consistent reflection and link the material to authentic situations.

In contrast, project-based assessments had the lowest percentage (65.3%). Teachers faced challenges in designing project-based assessments focusing on student projects. Overall, teachers' readiness in implementing deep learning can be categorized as high. However, it required improvements in project-based assessments and strengthened the learning context for optimal implementation of deep learning.

Furthermore, teachers' teaching experience influenced the learning approach mastery and implementation, including the application of deep learning. Guskey showed that prolonged teaching experiences are in line with advanced pedagogical skills. Teachers could implement various strategies and design authentic learning materials. In line with Rosita, her empirical study showed a significant relationship between age, teaching experience, and level of education with teacher professionalism at *MTs Al Urwatul Wustqo Bulurejo Diwek Jombang*. Our study provided Pancasila Education teachers' teaching experience in *Magetan* Regency.

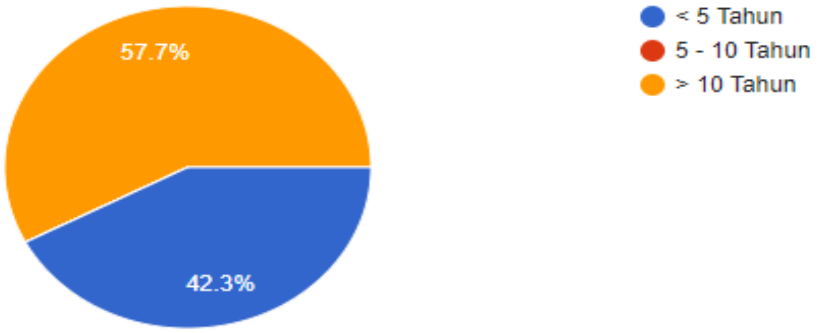

Figure 1. Pancasila Education Teachers' Teaching Experience in *Magetan* Regency

Our data showed that 42.3% of teachers had worked less than five years, and 57.7% worked for more than ten years. This data indicated that the percentage of teachers with more than ten years of teaching experience was greater than that of those with less than five years of experience. This factor contributed to the learning approach based on their learning experiences.

This situation seemed to provide advantages in the learning process. Teachers with more than ten years of experience generally showed advanced pedagogical skills, content knowledge, and adaptability to the school atmosphere. However, 42.3% teachers with less than five years of experience also presented a strength to quickly adapt to new technologies and innovative teaching methods, such as deep learning approaches.

Our study aligns with SDG 4 (Quality Education) in teachers' efforts to create inclusive, relevant, and student-centered learning. High levels of readiness in accommodating students' collaboration, students' participation, and the use of technology in improving the quality of the learning process and promoting equal learning opportunities. However, the low achievement in project-based assessment was indicated in the working progress. Further development is required to ensure that learning is oriented towards theoretical knowledge and 21st-century skills as one of the pillars of quality education, according to the SDG. By optimizing long-serving and novice teachers, implementing deep learning is expected further to strengthen the contribution to quality education in *Magetan* Regency.

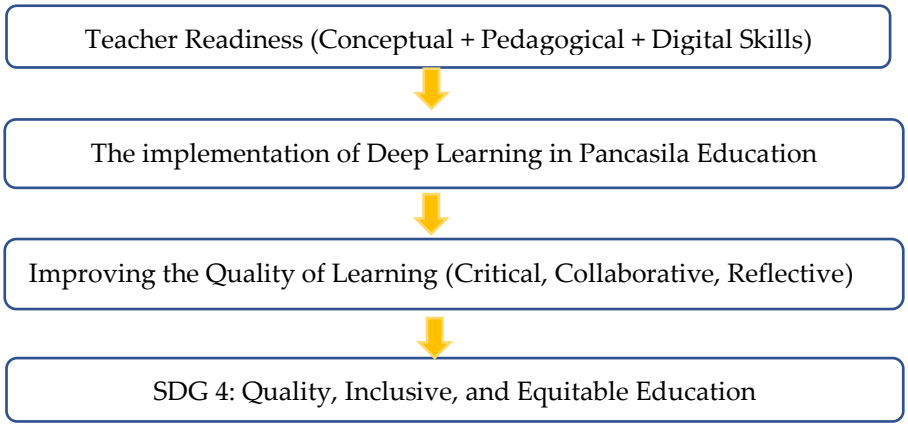

Figure 2. Analysis of Teacher Readiness in Implementing Deep Learning to Achieve SDG 4 Resource: The Researchers

3.1.3 Pancasila Education Teachers' Challenges in Implementing the Deep Learning Approach

Low result of project-based assessment (65.3%) and low student learning motivation were significant challenges to implementing deep learning among Pancasila Education teachers in *Magetan* Regency. Although other teachers' areas were found high readiness, such as students' collaboration

(88.4%), student participation (84.6%), the use of digital technology (80.7%), and encouragement of critical and analytical thinking (80.7%), low scores on the assessment aspects indicated that there was a practical gap between the implementation of interactive learning activities and the ability to assess learning outcomes. Those aspects are required in 21st-century products, processes, and skills.

Moreover, the low readiness in project-based assessment indicated several obstacles: (1) lack of teacher competence in designing project assignments with apparent, measurable, and standard; (2) lack of experience or training in the preparation of rubrics, process assessment, and collaborative assessment; (3) time constraints and administrative burdens making the project difficult to implement in depth; and (4) lack of supporting facilities and infrastructure (e.g., access to tools or platforms to record and assess of student products). These conditions caused learning to focus on acquiring declarative knowledge rather than the applicative competencies as the goal of deep learning.

The gap between the high use of technology (80.7%) and the low ability to develop project-based assessments indicated that technology might be used more for communication than authentic assessment. Furthermore, the demography of teachers in this study, with 57.7% of teachers having more than ten years of experience and 42.3% of new teachers having less than five years, indicated potential complementarity in human resources and possible barriers. Experienced teachers might need to update their skills in the latest assessment design. Novice teachers were more familiar with technology but lacked experience designing assessments.

Furthermore, interviews with Mr. GPA showed that students' low learning motivation was a barrier to implementing deep learning. Students reported that having low learning motivation made it difficult for long-term engagement, initiative, and responsibility to be developed. Low learning motivation was influenced by less authentic project assignments, a lack of assignment autonomy, and minimal formative feedback. Therefore, students lacked improvement, unstructured workloads, and external factors such as family support or home learning facilities. Project-based assessment felt like a heavy burden for students without strategies that increased relevance, recognition of results, and opportunities to demonstrate progress to achieve learning outcomes.

3.2 Discussion

A compulsory subject in Indonesia, Pancasila education, played an essential role in shaping students' character and national values (Istianah, Mazid, & Susanti, 2021). However, in practice, Indonesian students often learned on the surface learning stage or were limited to memorizing learning material without in-depth understanding (Widagdo, 2024). To respond to this challenge, the deep learning approach emerged as constructive instructional model. Deep learning in an educational context was not simply about acquiring recall skills. Still, a learning process emphasized student-centered activities, developing knowledge through analysis, reflection, connecting concepts, and upholding values in real life (Santiani, 2025). In Pancasila education, deep learning encouraged students to not only understand the theory and concept of Pancasila values, but also to apply them in their daily lives and decisions. Therefore, they developed individuals with civic awareness and high integrity.

Implementing deep learning in the Pancasila Education subject is correlated with strengthening national education quality (Putri, 2024). The Minister of Primary and Secondary Education, Prof. Abdul Mu'ti, M.Ed., recognized deep learning that influenced a fundamental aspect in elevating human beings based on personal strengths and abilities. In accordance with the Merdeka Curriculum, the value of fostering empathy, respecting diversity of learners, and providing individual comprehensive growth (Salwa Sausan & Liesna Andriany, 2024). The implantation of this approach was not limited to a teaching technique. However, an educational paradigm positioned teachers as facilitators of in-depth and transformative learning.

The first principle of deep learning is mindful, and education is defined as a deliberate learning process (Kurniawan, 2025). The principle included teachers' attention to students' affective domain, sociocultural backgrounds, and learning needs. Therefore, classroom interactions moved beyond

knowledge transmission into building character and empathy. In practice, Pancasila Education teachers were required to receive training on designing equitable learning environment, valuing human diversity, and differentiating instruction. Deep learning is aligned with Pancasila's values of humanity, justice, and diversity.

The second principle of deep learning is meaningful, which underlines comprehending the value beyond learning material (Feriyanto & Anjariyah, 2024). The education field recognizes various cognitive, affective, and practical aspects. Therefore, it would guide students' reflection based on a practical context. Teachers played a role in designing learning materials related to students' everyday experiences, social dynamics, and current national issues. Therefore, knowledge did not stop at memorizing; it transformed into critical awareness, analytical skills, and ethical responsibility to civic and national affairs.

The third principle of deep learning is joyful, highlighted to design joyful and engaging learning process (Sumarni & Yona Okyranida, 2025). Enjoyable learning process did not mean limited to systematic learning, but pointed out students' development of motivation, curiosity, and reinforcement during the learning process and outcomes (Ahmad Syafi'i & Darnaningsih, 2025). In this case, enjoyable learning process could be developed through interactive methods, case-based learning, and collaborative discussions. Therefore, this third principle could be achieved by students by applying Pancasila values in everyday life.

These three principles – mindful, meaningful, and joyful – complemented each other in fostering student-centered learning (Rosalina & Sen, 2022). This approach required teachers to master learning materials and technology, pedagogical responsiveness, and classroom management skills (Yanita et al., 2024). The influence of digital technology in the Society 5.0 era could be integrated into implementing three principles: online learning platforms, interactive media, and diverse digital learning resources for students' comprehension (Malay, Tania, Ardiansyah, Adifka, & Irawan, 2025). Pancasila Education and deep learning could be interwoven to develop students' critical thinking, empathy, and collective welfare.

Furthermore, SDG 4 (Quality Education) targeted quality education for all citizens and provided lifelong learning opportunities (See Figure 1). In Indonesia, the SGD 4 vision is aligned with the principles of mindful, meaningful, and joyful learning. First, mindful ensured students' value of equality. Second, meaningful emphasized the applicability of knowledge from the context. Third, joyful created positive learning experience and active engagement. Those aspects were fundamental principles for developing humans' character, creativity, and adaptability in response to global challenges (Mubarok, Herdiawan, & Nurhidayat, 2024).

However, our preliminary survey showed that teachers understood deep learning principles as a sustainable learning approach, but students had low motivation in junior high school in *Magetan* Regency. This result indicated that SDG 4 (Quality Education) in Indonesia could potentially hinder the achievement of equitable quality of learning and the maximum development of individual students.

Pancasila Education teachers' readiness to implement a deep learning approach was relevant to SDG 4 (Quality Education) in quality, inclusive, and equitable education. Moreover, it also promoted lifelong learning opportunities. Furthermore, teachers' core competencies were essential as points of departure for teacher professional identity. First, personality competency is the ability to reflect an experienced, insightful, influential, and honorable. Teachers also need the ability to serve as a good role model for students (Zola & Mudjiran, 2020). Second, pedagogical competencies are understanding student characteristics, lesson design, and teaching practices. They attempt to develop students' potential learning and evaluate learning outcomes based on their abilities (Akbar, 2021). Third, social competence requires teachers to have communication skills and interaction with educational staff, students, parents, and society (Mazrur, Surawan, & Yuliani, 2022). Fourth, professional competence is teachers' content pedagogy (Bagou & Suking, 2020). Moreover, professional competence also covers curriculum mastery, learning material underlying principles, and methodology. These four competencies reinforce each other and serve as key pillars for teachers in achieving quality learning.

SDG 4 (Quality Education) contributed to achieving other SDGs. Quality education could address structural poverty, foster economic empowerment, and nurture future generations to contribute to sustainable development (Unterhalter, 2019).

The impact of these challenges had implications for achieving SDG 4 (quality education). If assessments focus on lower-level cognitive aspects, 21st-century skills collaboration, creativity, problem-solving, and communication will be compromised (Thornhill-Miller et al., 2023). Our study highlighted that learning outcomes were less aligned with the goals of quality education that emphasized authentic, practical skills.

This study suggested steps to overcome those challenges. First, teachers could be empowered through explicit project design, rubric, and assessment training. Second, peer mentoring could be conducted (pairing long-serving teachers with novice teachers). Third, projects received adequate time allocation through design time and curriculum management. Fourth, teachers needed to use technology for assessment (e-portfolios, video documentation, LMS for peer assessment). Fifth, teachers provided learning strategies to increase student motivation, such as delivering assignment choices, authentic learning projects, and formative feedback.

Ultimately, this study found promising results for many indicators of teacher readiness for deep learning. However, teachers' capacity to handle project-based assessment and student motivation needs further study. This study suggested improving authentic assessment skills, providing structural and technological support for assessment, and empowering pedagogical strategies. Therefore, teachers could enhance student autonomy, increasing the chances of successful deep learning implementation and contributing to achieving SDG 4 in Indonesia.

4. CONCLUSION

This study confirms that Pancasila Education plays an essential role in developing national character, identity, and integrity. This aligns with the Merdeka Curriculum's mandate, which prioritizes student-centered learning. Deep learning implementations with mindful, meaningful, and joyful principles have proven relevant for upgrading the quality of Pancasila Education instruction in junior high schools in *Magetan* Regency. The results of this study indicate that teacher readiness is high, notably in facilitating students' collaboration (88.4%), student participation (84.6%), and the use of digital technology and Encouragement of critical and analytical thinking (80.7%). However, project-based assessment showed the lowest readiness (65.3%). This study indicated the need for a follow-up program to develop teacher competency in designing authentic assessments, so they are ready for the demands of 21st-century skills. Another challenge, low student motivation, emerged as a barrier to successfully implementing deep learning and pedagogical strategies so that teachers can help students achieve relevance, autonomy, and engagement. The findings of this study contribute to achieving SDG 4 (Quality Education) for inclusive, equitable, and sustainable quality education. Limitations of this study involved a relatively small number of teachers from a specific region, so the findings cannot be generalized to all Pancasila Education teachers in Indonesia. The limited variation in school contexts (urban rural, facilities, accreditation status) may influence the range of experiences and interpretations of the data. Future research is projected to cover a wider area and reveal variations in teacher readiness across regions, particularly regarding internet access and facilities. Intensive training in AI for Education and digital pedagogy is needed.

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Conflicts of Interest: The authors report no conflicts of interest.

Ethical Considerations: This research was carried out in line with ethical standards to safeguard the rights, privacy, and welfare of all participants. Before any data was gathered, informed consent was secured from each participant. They received both verbal and written explanations detailing the study's purpose, the procedures involved, possible benefits and risks, and their freedom to withdraw at any point without any negative

consequences. The consent document clearly stated that participation was entirely voluntary and that all collected data would remain confidential.

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