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ARTIKEL

Teacher Learning Reflections: Advancing Deep Learning Pedagogy in Vocational Education

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Abstrak

Purpose: Penelitian ini bertujuan memotret tingkat dan profil praktik refleksi guru SMK serta menganalisis hubungannya dengan kualitas praktik mengajar dalam kerangka *deep learning* guna mengatasi variasi mutu instruksional berkelanjutan. **Method:** Menggunakan desain survei deskriptif kuantitatif. Data dikumpulkan melalui instrumen kuesioner skala Likert yang disebarkan kepada sampel 1.294 guru SMK di Indonesia melalui teknik *non-probability purposive/snowball sampling*. Analisis menggunakan statistik deskriptif (rata-rata, persentase, kategorisasi rendah-sedang-tinggi) dan visualisasi indikator refleksi. **Findings:** Hasil menunjukkan praktik refleksi guru berada pada kategori tinggi, khususnya dimensi praktis dan kritis, sedangkan dimensi emosional lebih bervariasi. Pada aspek proses, guru kuat dalam deskripsi pengalaman, analisis/evaluasi, dan identifikasi pembelajaran. Dampak paling efektif terlihat pada perkembangan profesional dan keterlibatan siswa. Respon subjek mengonfirmasi bahwa refleksi terstruktur berkontribusi pada peningkatan instruksional. **Practical implications:** Memberikan panduan bagi guru untuk menjadwalkan waktu refleksi khusus, menggunakan rubrik pertanyaan panduan dan data formatif (termasuk Tes Kompetensi Akademik), serta mengoptimalkan *coaching*/PLC untuk tindak lanjut pembelajaran. **Originality:** Studi ini memberikan kontribusi unik berupa pemetaan empiris berskala besar (1.294 guru) mengenai profil refleksi guru vokasi yang mengintegrasikan sumber mandiri dan eksternal dalam ekosistem *deep learning*.

Kata kunci: Guru Vokasi, *Deep Learning*, Kuesioner Likert, *Professional Learning Community*, Refleksi Pembelajaran.

Abstract

Purpose: *This study aims to examine the level and profile of vocational school teachers' reflection practices and analyze their relationship with teaching quality within a deep learning framework to address unsustainable instructional improvements.* ***Method:*** *A quantitative descriptive survey design was employed. Data were gathered using a Likert-scale questionnaire distributed to a sample of 1,294 vocational school teachers in Indonesia selected via non-probability purposive/snowball sampling. Analysis involved descriptive statistics (mean, percentage, low-medium-high categorization) and visualization per reflection indicator.* ***Findings:*** *The results indicate that teachers' reflection practice is at a high level, particularly in the practical and critical dimensions, while the emotional dimension is more varied. Regarding the process aspect, teachers demonstrate strong capacity in experience description, analysis/evaluation, and learning identification. The most effective impact is observed in professional development and student engagement. Subjects' responses confirm that structured reflection contributes to sustainable instructional enhancement.* ***Practical implications:*** *Provides actionable guidelines for teachers to schedule dedicated reflection time, utilize guided question rubrics and formative data (including Academic Competency Tests), and leverage coaching/PLCs for instructional follow-up.* ***Originality:*** *This study offers a unique contribution by presenting a large-scale empirical mapping (1,294 teachers) of vocational teachers' reflection profiles that integrates self-directed and external sources within a deep learning ecosystem.*

Keywords: *Deep Learning, Learning Reflection, Likert Questionnaire, Professional Learning Community, Vocational Teachers.*

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INTRODUCTION

The implementation of learning in vocational schools is directed to produce graduates who are competent, characterful, and ready to work in accordance with the mandate of Law No. 20/2003 concerning the National Education System, Government Regulation No. 57/2021 concerning National Education Standards (and its amendments), and Permendikbudristek No. 16/2022 concerning Process Standards which emphasizes the planning–implementation–assessment of learning and continuous improvement by educators (PSKP, 2024). In line with that, the Independent Curriculum encourages more meaningful and student-centered learning, providing space for projects, formative assessments, and the use of feedback-reflection to deepen understanding of the deep learning approach (Ministry of Education and Education, 2025). At the vocational policy level, the Directorate of Vocational Schools even placed the "Scheme for Strengthening Deep Learning Approaches" as one of the priority programs for 2025 while emphasizing that the National Assessment (ANBK) must be used as a reflection material for improving the quality of vocational learning (Directorate of Vocational Schools, 2025).

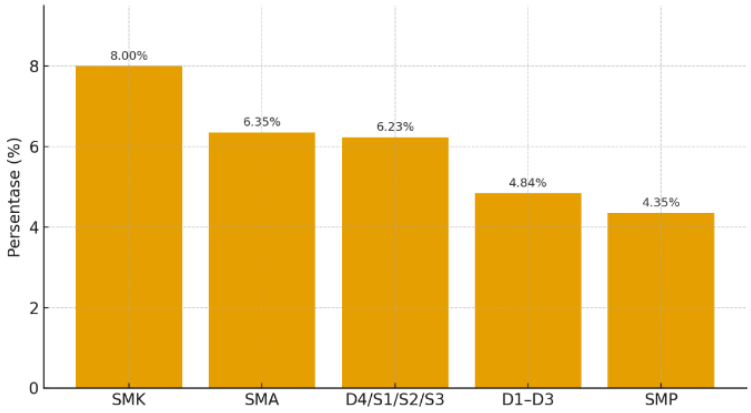


Figure 1. Open Unemployment Rate(BPS, 2025)

But reality presents serious challenges. The PISA 2022 results place the proportion of Indonesian students who achieve the minimum proficiency still low: only 18% (mathematics), 25% (reading), and 34% (science), well below the OECD average, which indicates an urgent need for teaching practices that foster high-level reasoning through a consistent cycle of reflection (OECD, 2025). In terms of graduate competitiveness, the Open Unemployment Rate (TPT) according to education as of February 2025 shows that vocational school graduates are still the highest (8.00%) compared to other graduates (SMA 6.35%; D4/S1/S2/S3 6.23%; D1–D3 4.84%; Junior High School 4.35%), reflecting the importance of improving the quality of teaching practices that prepare essential and in-depth skills. At the same time, the 2024 AN data does record an increase in the proportion of students who reach the minimum competency in literacy (2022: 59.49% → 2024: 70.03%) and numeracy (2022: 45.24% → 2024: 67.94%),

but the disparity is still high between regions, so it requires an improvement strategy based on teacher reflection at the education unit level.

Figure 1 explains that the position of vocational schools is still the most vulnerable in the job market. The gap between ideal conditions (regulations and curricula that require reflection-based deep learning) and factual conditions (low minimum competency achievements, disparities between regions, and high TPT of vocational school graduates) indicates that the practice of learning reflection in schools often does not run as a systematic cycle (plan–act–observe–reflect) and has a direct impact on the quality of teaching practices. In fact, the Directorate of Vocational Schools has emphasized AN/ANBK as a diagnostic tool for reflection and improvement of learning quality, especially literacy-numeracy and learning environment.

The latest empirical evidence (2025) reinforces that urgency. Teachers have a very positive attitude towards reflection, but the frequency of reflection practices is still moderate and digital technology is rarely used, indicating the need for institutional support so that reflection has an impact on improving teaching practices (Alshammari & Alrashidi, 2025). In the STEAM training, it was found that structured reflection significantly improved the design thinking mindset of empathetic teachers, creative confidence, and the ability to adapt strategies which are prerequisites for deep learning (ElSayary et al., 2025). In Indonesia, it is revealed that teachers show high interpersonal and behavioral reflection but are still weak in critical-strategic reflection and technology integration (Rahman et al., 2025); hence a professional development program that guides reflection is needed to connect with real instructional improvements (Nolan & Zeidler, 2025). The implementation of the Independent Curriculum also shows that reflective teaching has an impact on improving teacher competence, teaching quality, and learning outcomes (critical-collaborative), although many teachers still need intensive assistance (Haryono et al., 2021). Conceptually, the deep learning approach is oriented towards the development of the 6Cs (Character, Citizenship, Collaboration, Communication, Creativity, Critical thinking) so that it requires a strong reflective culture at the teacher level to design meaningful learning experiences.

Thus, the urgency of writing this article lies in the need to strengthen the reflection of teacher learning in vocational schools as a core mechanism for improving the quality of teaching practices linking assessment findings (AN/PISA) with improving learning design and classroom assessment—so that learning truly produces in-depth competencies that are relevant to the world of work. This is strategic to reduce the TPT of vocational school graduates while reducing the achievement gap between regions through standardized but contextual practices. Based on this background, the purpose of writing this article is to find out the role of teacher learning reflection in improving the quality of teaching practices in the deep learning approach in vocational schools including the form, intensity, prerequisites, and their

impact on learning design, classroom interaction, formative assessment, and meaningful learning outcomes.

METHOD

This study uses a quantitative descriptive survey design to photograph the level of teacher reflection practice and its relationship with the quality of teaching practices based on deep learning approaches in vocational schools. Data was collected once (cross-sectional) through a Likert scale online questionnaire. The research population is vocational school teachers throughout Indonesia. Respondents were selected using non-probability sampling techniques (purposive and snowball), namely teachers who were actively teaching in the research year. The minimum target of respondents was determined by the Cochran formula for proportion data at a confidence level of 95% and a margin of error of 5%, which was 384 teachers. The procedure of this research includes (1) Preparation: Preparation of the grid, formulation of items, trials, revisions. (2) Dissemination: The questionnaire is distributed through an online link to vocational school teachers throughout Indonesia. (3) Data collection: Responses were collected in a span of 2–4 weeks. (4) Data cleanup: Delete double, incomplete, or extreme data. (5) Data analysis: Using descriptive statistics (mean, elementary, percentage) to describe the teacher's level of reflection and the quality of teaching practice. Then data analysis and visualization by calculating (1) the average score of the indicator $\bar{X}d = (1/n)\ \Sigma\ (1/kd\ \Sigma\ xijd)$; (2) Conversion to standard percentage: $Sd(\%) = ((\bar{X}d - Xmin) / (Xmax - Xmin)) \times 100$ with $Xmin = 1$, $Xmax = 4$; (3) Categorization: Low 0–<55%, Medium 55–<75%; Height 75–100%. Visualization i.e. percentage score per indicator is plotted in a bar chart to show the comparison between indicators.

RESULT AND DISCUSSION

This research succeeded in collecting data from 1,294 vocational school teachers spread across various regions of Indonesia. Respondents came from public and private vocational schools, with diverse expertise program backgrounds. The number of respondents has exceeded the minimum sample limit calculated by the Cochran formula (384 respondents), so the data is considered representative to describe the conditions of reflection on the learning of vocational teachers at the national level. The wide distribution of respondents allows for a more comprehensive analysis of teachers' reflection practices in improving the quality of learning. With a high number of participations, this data provides a clear picture of how vocational school teachers apply learning reflection in daily practice, as well as how it contributes to the quality of learning based on deep learning approaches.

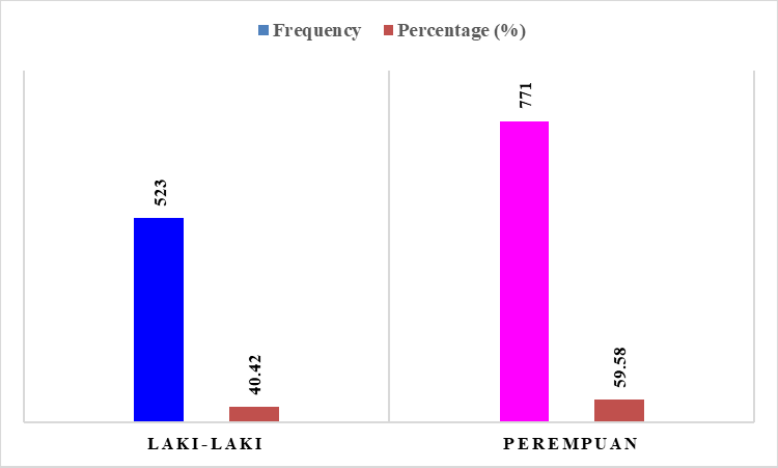


Figure 2. Gender

The bar image depicts the distribution of respondents by gender with a clear presentation of frequency and percentage data. The blue bar shows the number of male respondents as many as 523 people or 40.42%, while the pink bar (magenta) depicts the number of female respondents as many as 771 people or 59.58%. The number displayed on each bar makes it easy to read and shows the difference in proportions directly. From this data, the number of female respondents is more than that of men with a difference of around 19.16%. These findings show that women's participation in surveys is more dominant, so it can be an important consideration in the analysis of demographic characteristics and the influence of gender variables on other research variables.

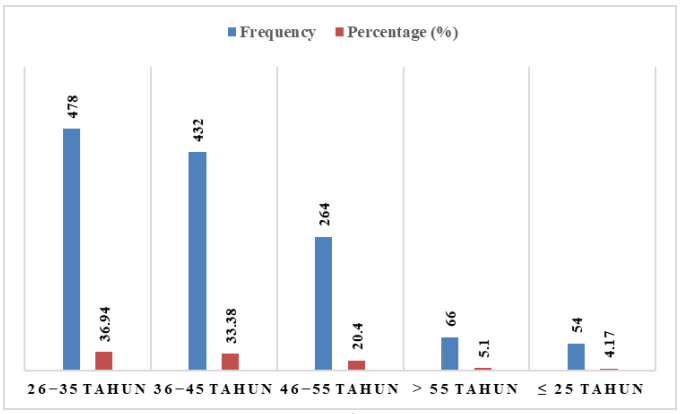


Figure 3. Age

The bar image shows the distribution of respondents by age group in the study. The age group of 26-35 years had the highest number of respondents, namely 478 people or 36.94% of the total respondents. In second place, the age group of 36-45 years accounted for 432 respondents or 33.38%, followed by the group of 46-55 years with 264 respondents or 20.4%. Meanwhile, the age group over 55 years old only amounted to 66 respondents or 5.1%, and the age group of 25 years and below had the least number of respondents, namely 54 people or 4.17%. This data shows that the majority of respondents are in the productive age range, which is between 26 and 45 years old, which reflects the dominance of the active adult age group in this survey. This condition can affect the interpretation of research results, especially if the age variable is related to teaching experience, technological understanding, or involvement in the deep learning process.

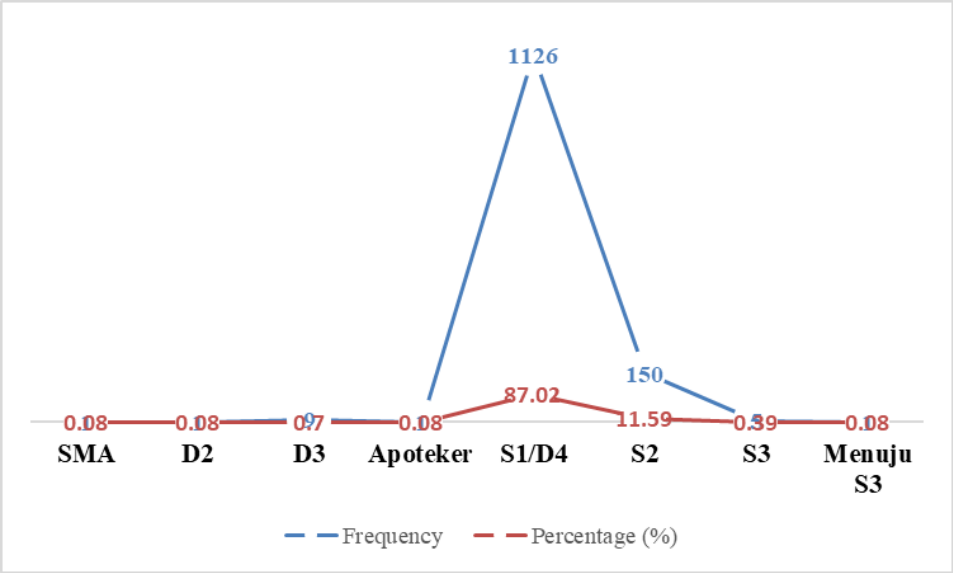


Figure 4. Education

The line drawing depicts the distribution of respondents based on last education. From the graph, it can be seen that most of the respondents have the last education of S1/D4, with a total of 1,126 people or 87.02% of the total respondents. This shows that the majority of survey participants have a bachelor's education background. The next category is S2 with 150 respondents or 11.59%, which is the second largest group. Meanwhile, the number of respondents with S3 education was very small, only 5 people or 0.39%, and the categories of Towards S3, High School, D2, D3, and Pharmacists each had only 1 person or 0.08% of the total respondents. This distribution shows that the majority of respondents have high academic qualifications, with the dominance of undergraduate and postgraduate graduates. This condition can be an important indicator that respondents have a strong formal education background, which has the potential to influence their perception and competence in professional and deep learning contexts.

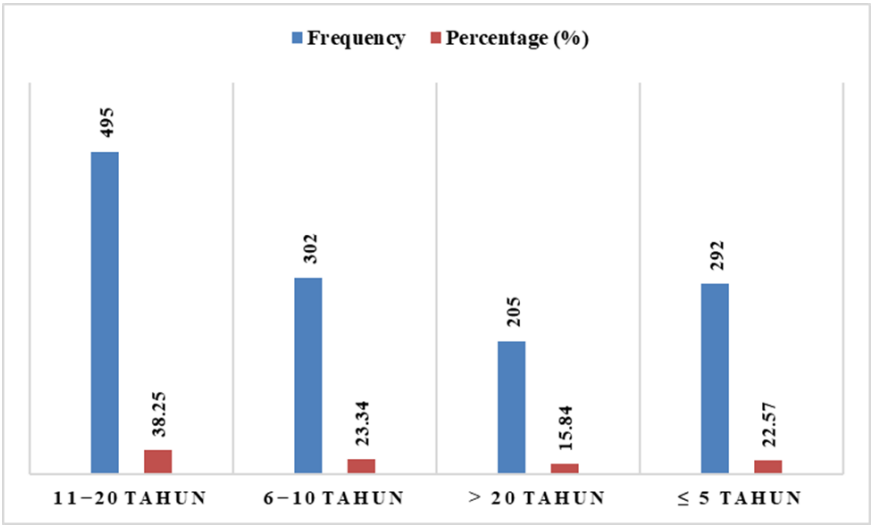


Figure 5. Long Teaching Time

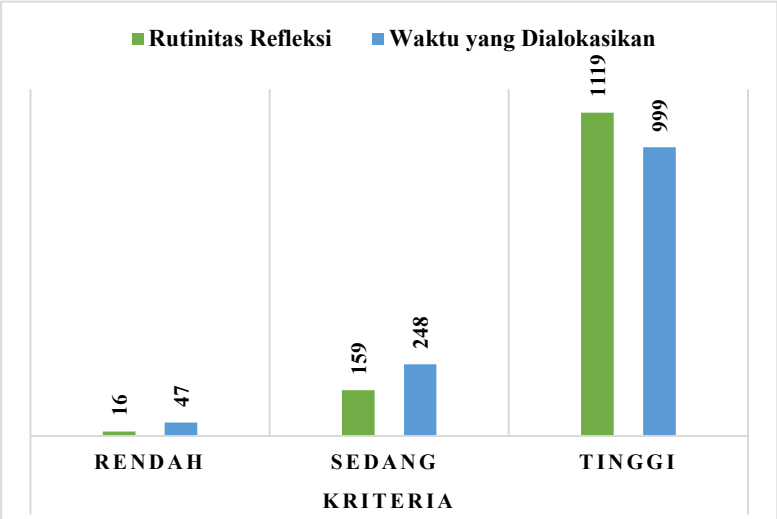
The bar image shows the distribution of respondents based on teaching time in units of years. The group with a working period of 11-20 years had the largest number of respondents, namely 495 people or 38.25% of the total respondents. In second place, the group with a teaching period of 6-10 years recorded 302 respondents or 23.34%, followed by the 5-year ≤ group with 292 respondents or 22.57%. Meanwhile, the group with a service period of more than 20 years had the least number of respondents, namely 205 people or 15.84%. These findings show that the majority of respondents are in the middle service category, specifically between 6 and 20 years. This may reflect that most of the respondents have had a considerable amount of teaching experience, so they are likely to have professional maturity and a deep understanding of learning practices in the field. This distribution also provides an important overview for further analysis of the relationship between teaching length and level of competence or engagement in deep learning.

Table 6. Reflection Frequency and Regularity Indicator

No	Visual	Criterion (%)		
		Low	Medium	High
1	Reflection Routine	0,85	19,73	79,42
2	Time Allocated	3,63	23,03	73,34

Table 6 illustrates the level of frequency and regularity of reflection of vocational school teachers on two main indicators, namely Reflection Routine and Allocated Time. The number of respondents in both indicators was the same, which was 1,294 people. In the Reflection Routine indicator, only 16 respondents (0.85%) were in the low category (score 1–2), 159 respondents (19.73%) were in the medium category (score 3), and the majority, namely 1,119 respondents (79.42%), were in the high category (score 4–5).

These results show that most teachers reflect on learning regularly and regularly. Meanwhile, in the Allocated Time indicator, as many as 47 respondents (3.63%) were in the low category, 248 respondents (23.03%) were in the medium category, and 999 respondents (73.34%) were in the high category. Although the proportion of high categories still dominates, there is a slight decrease compared to the first indicator, which suggests



that even if reflection is done regularly, some teachers may face limitations in terms of allocating enough time for deep reflection. Overall, Table 6 shows that the frequency and regularity of teachers' reflections are at a high level, but there is still room for strengthening, especially in terms of reflection time management to be more optimal and evenly distributed across all respondents.

Figure 6. Frequency and Regularity of Reflection

Figure 6 shows most teachers are in the high category for both reflection routines and time allocated, marking a relatively well-established culture of reflection in this population. The findings are in line with the literature that confirms that frequent and scheduled reflection is associated with improved pedagogy and more adaptive instructional responses to students' learning needs (Kolajo, 2025; Internship & Internship, 2023; Cirocki, 2024). Consistent reflection practice is an engine for instructional improvement because it encourages teachers to assess the effectiveness of strategies, evidence of student learning, and follow-up decisions in the classroom (Kolajo, 2025; CBE-LSE Primer, 2023). In the Indonesian context shown in Figure 6, the dominance of this high category indicates an institutionalized habit of reflection, especially when linked to other indicators in the manuscript (e.g., environmental support and impact) that are also strong in creating an ecosystem conducive to deep learning pedagogy. Recent psychometric evidence suggests validated teacher reflection instruments are able to reliably capture the practical (technical–practical–critical) dimensions, and higher reflection scores correlate with sharper instructional decisions (Estaji & Farahian, 2023). In Indonesian novice teachers, the understanding of the nature of reflection also develops from descriptive to critical, especially when there is scaffolding and the community of practice supports the interpretation that the high numbers in Figure 6 do not stand alone, but are related to professional sensemaking (Derinalp et al., 2022).

The literature emphasizes that structured time allocation for reflection (e.g. job-embedded PD, PLC) strengthens transfer to practice, improves teaching efficacy, and ultimately the quality of learning (Zhou

et al., 2023; Cirocki, 2024). Meta-analyses of PD showed a strong moderate effect on teacher outcomes when PD provided space for continuous reflection that was coherent with classroom practice (Zhou et al., 2023). Reflection-framed PD interventions also improve self-efficacy and instructional decision-making (Cirocki, 2024) and have an impact on teachers' readiness to adapt evidence-based practices. Recent studies emphasize that moving from descriptive reflection to critical reflection reflecting assumptions, goals, fairness, and context is the fulcrum of improving deep learning strategies (Kolajo, 2025). The practitioner primary also highlighted that structure (guide questions, rubrics), classroom data (formative assessments), and peer dialogue deepened the quality of reflection (CBE-LSE Primary, 2023). When sufficient time is allocated (as reflected in Figure 6), teachers are more likely to reach the critical reflection layer associated with cognitive task design challenging key features of deep learning.

Table 7. Process and Stages of Reflection

No	Visual	Criterion (%)		
		Low	Medium	High
1	Experience Description	1,86	14,84	83,30
2	Analysis/Evaluation	1,86	9,43	88,71
3	Learning Identification	1,93	13,07	85,00

Table 7 shows the distribution of frequency and percentage of respondents in the three main stages of learning reflection - Experiential Description, Analysis/Evaluation, and Learning Identification - with a total of 1,294 respondents. In the Experience Description indicator, as many as 24 respondents (1.86%) were in the low category (score 1–2), 192 respondents (14.84%) in the medium category (score 3), and the majority of 1,078 respondents (83.30%) in the high category (score 4–5). These findings suggest that most teachers are able to reflect on their learning experiences reflectively.

In the Analysis/Evaluation indicator, the number of respondents in the low category remained at 24 people (1.86%), but the proportion of the medium category decreased to 122 people (9.43%), while the proportion of the high category increased to 1,148 respondents (88.71%). This means that most teachers not only describe experiences, but also conduct reflective evaluations of the learning process quite strongly. The Learning Identification Indicator showed a similar pattern with 25 respondents (1.93%) in the low category, 169 respondents (13.07%) in the medium category, and 1,100 respondents (85.00%) in the high category. This indicates that teachers are relatively consistent in recognizing lessons and insights gained from their teaching process. In general, Table 7 shows that the reflection practice of vocational school teachers is quite strong in the aspects of experience description and analysis, and stable in identifying learning. However, there are still a small number of respondents in the low and medium category, which indicates the need to increase reflective capacity for some teachers.

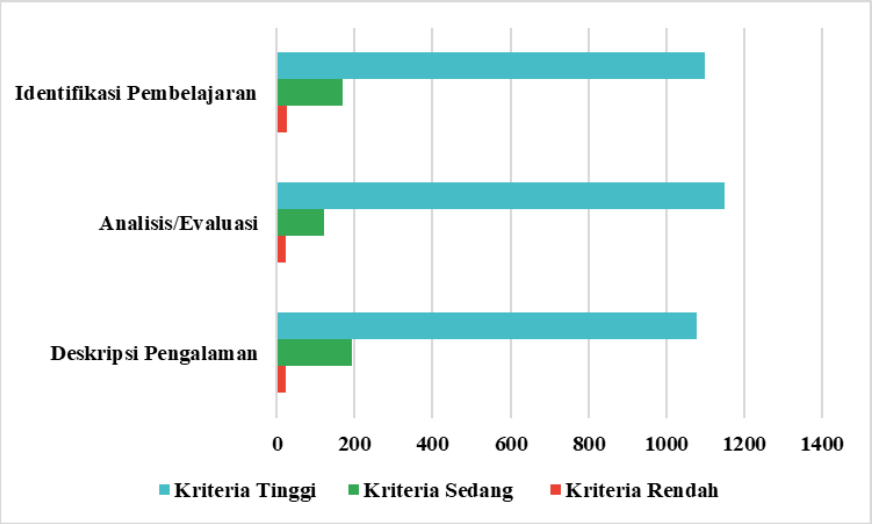


Figure 7. Process and Stages of Reflection

Figure 7 summarizes the process/stages of reflection of teachers and is in line with the pattern in the datashowing a high proportion at the stages of experience description, analysis/evaluation, and identification of learning, thus indicating the practice of reflection that is not only descriptive but has moved into the evaluative-constructive realm. Theoretically, this tendency is in line with the reflection-level framework (habit–understanding–reflection–critical reflection) which asserts that the quality of reflection improves when teachers link evidence from the classroom to instructional decision-making (Kember et al., 2008; Loughran, 2002). Other evidence suggests that reflection tools/structures (e.g., response journals, guide questions) encourage deepening from descriptions to analysis and improvement plans, which in turn reinforces professional learning and adaptation of teaching strategies (Lee, 2008; Akbari, 2007). Thus, the profile of Figure 7 can be interpreted as a powerful capital to expand reflection to a critical level (questioning the assumptions, goals, and impacts of learning justice) while closing the gap in the "follow-up planning" stage so that the plan–act–observe–reflect cycle becomes complete and transformative for classroom practice.

Tabel 8. Dimension Focus/Reflection

No	Visual	Criterion (%)		
		Low	Medium	High
1	Technical Reflection	3,48	21,95	74,57
2	Practical Reflection	1,55	8,58	89,88
3	Critical Reflection	1,55	8,11	90,34
4	Emotional Reflection	5,10	18,47	76,43

Table 8 presents the distribution of frequency and percentage of respondents in the four main dimensions of learning reflection, namely *Technical Reflection*, *Practical Reflection*, *Critical Reflection*, and *Emotional Reflection*, with a total of 1,294 respondents for each indicator. In the Technical Reflection indicator, as many as 45 respondents (3.48%) were in the low category (score 1–2), 284 respondents (21.95%) in the medium category (score 3), and 965 respondents (74.57%) were in the high category (score 4–5). These findings show that the majority of teachers already have the ability to reflect on technical aspects of learning, such as the implementation of teaching strategies, media, and instruments used in the classroom.

The Practical Reflection indicator showed a greater dominance of the high category, with 20 respondents (1.55%) in the low category, 111 respondents (8.58%) in the medium category, and 1,163 respondents (89.88%) in the high category. This means that teachers have broadly reflected on learning practices that occur in the classroom and relate them to the broader learning context. Furthermore, Critical Reflection is the dimension with the largest proportion of the high category. It was recorded that 20 respondents (1.55%) were in the low category, 105 respondents (8.11%) were in the medium category, and 1,169 respondents (90.34%) were in the high category. This shows that most teachers have been able to do deep reflection, assessing the relevance, effectiveness, and strategic goals of their teaching practices.

Meanwhile, Emotional Reflection showed a slightly more varied pattern with 66 respondents (5.10%) in the low category, 239 respondents (18.47%) in the medium category, and 989 respondents (76.43%) in the high category. This indicates that although the majority of teachers are able to recognize affective and emotional aspects of learning, this dimension has a relatively higher percentage of medium and low categories than other dimensions. Overall, Table 8 shows that the reflection ability of vocational school teachers is strongest in the practical and critical dimensions, followed by technical and emotional. This indicates that teachers not only reflect on the procedural aspects of learning, but also associate reflection with strategic thinking and emotional context, although the latter aspect still needs further reinforcement.

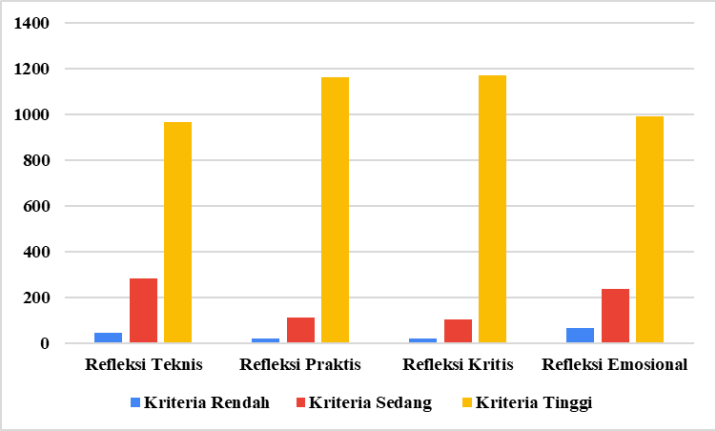


Figure 8. Dimensions/Reflections

Figure 8 shows the focus of the strong dimensions of teacher reflection on the practical and critical realms (proportion of high categories dominate), followed by technical, while emotional is relatively more varied (medium-low portions are larger than other dimensions). This pattern is prevalent when reflection practices move from descriptive to analytical–critical—teachers compare alternatives, weigh classroom evidence, and then interpret the pedagogical implications (Jay & Johnson, 2002; Hatton & Smith, 1995). The dominance of the practical/critical dimension is in line with the finding that good instruments and frameworks of reflection drive a leap in quality from just "what happened" to "why/so what/what next" (Larrivee, 2008; Korthagen & Vasalos, 2005). The emotional side that is still more widespread indicates a space to strengthen teachers' social-emotional competence and a safe climate for self-reflection, as the emotional aspect correlates with the quality of classroom interactions and instructional decisions (Jennings & Greenberg, 2009; Boud & Walker, 1998). Overall, the profile of Figure 8 indicates a practical–critical mature reflection capital; To accelerate the impact on deep learning, it is necessary to be supported by evidence-based reflection structures and support for teachers' emotional well-being so that the emotional dimension is also strengthened.

Table 9. Reflection Sources and Tools

No	Visual	Criterion (%)		
		Low	Medium	High
1	Self-reflection tools	4,64	14,45	80,91
2	External Sources	2,16	12,52	85,32

Table 9 illustrates the distribution of frequency and percentage of respondents in the use of reflection tools and sources. There are two main indicators in this table, namely *Independent Reflection Tools* and *External Sources*, with a total of 1,294 respondents for each indicator. In the Independent Reflection Tool indicator, as many as 60 respondents (4.64%) were in the low category (score 1–2), 187 respondents (14.45%) in the medium category (score 3), and 1,047 respondents (80.91%) were in the high category (score 4–5). These findings suggest that most teachers actively use personal reflection tools, such as journals, learning notes, or self-reflection after teaching. Meanwhile, in the External Sources indicator, the distribution of respondents showed 28 respondents (2.16%) in the low category, 162 respondents (12.52%) in the medium category, and 1,104 respondents (85.32%) in the high category. This figure is slightly higher than the first indicator, which indicates that many teachers not only rely on self-reflection, but also use external sources, such as discussions with peers, training, supervision, or other learning resources in the process of learning reflection. Overall, Table 9 shows that the use of reflection tools and sources by vocational school teachers is at a high level, both in independent and external forms. These findings illustrate that the culture of reflection among teachers is not only individual, but also

collaborative and open to external input, which can enrich the process of improving the quality of learning.

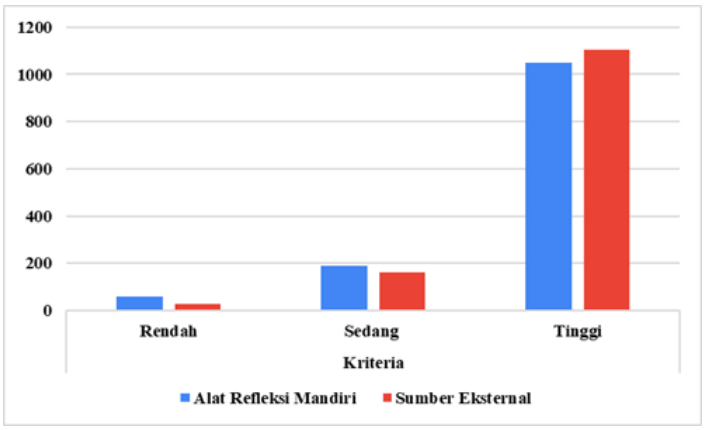


Figure 9. Reflection Sources and Tools

Figure 9 shows that the use of self-reflection tools and external sources is in the high category (≈80.91% and 85.32%), which indicates that the culture of teacher reflection is not only based on individual practice (e.g., journals, post-teaching notes), but also on professional dialogue (coaching, PLC, supervision, and coaching). This pattern is consistent with evidence that PLCs are associated with improvements in practice and learning outcomes when teachers share classroom data and structure shared follow-ups (Vescio, Ross, & Adams, 2008). The leverage mechanism comes from two sides: (1) reflection tools that allow teachers to externalize evidence and assess practice systematically—for example, journals/video-reflections that have been proven to deepen the quality of reflection and encourage evidence-based instructional decisions (Hamel, 2019; Kong, 2010; Richter et al., 2022)—and (2) external sources that facilitate reflective collaboration through peer/mentor coaching and community of practice so that reflection shifts from descriptive to analytical-critical (Soisangwarn & Wongwanich, 2014; Kamali & Javahery Tehrany, 2024).

In the context of teacher education, collaborative video feedback enriches the identification of practice problems and the quality of pedagogical responses (Liesa et al., 2023), while peer-to-peer discussion-based mentoring clarifies the social dimension of reflection so that reflective activity design is more effective and transformative (Tiainen et al., 2024). The synthesis: high levels of *self-contained tools* provide basic capacities (externalization of evidence and personal metacognition), while the dominance of *external sources* provides leverage capacities (dialogue, feedback, and collective accountability) that convert reflection into instructional action—thus the *plan–act–observe–reflect* cycle more complete and have an impact on deep learning. (Vescio et al., 2008; Soisangwarn & Wongwanich, 2014; Hamel, 2019; Kong, 2010; Richter et al., 2022; Liesa et al., 2023; Tiainen et al., 2024).

Table 10. Impact and Utilization of Reflection Results

No	Visual	Criterion		
		Low	Medium	High
1	Changes in Teaching Practices	4,64	25,97	69,40
2	Improved Student Understanding	9,51	34,62	55,87
3	Professional Development	1,78	15,15	83,08
4	Increased Student Engagement	2,86	15,38	81,76

Table 10 shows the distribution of frequency and percentage of respondents on four main indicators that illustrate the real impact of the learning reflection process on the teaching practice of vocational school teachers. The number of respondents for each indicator was 1,294 people. In the indicator of Teaching Practice Change, as many as 60 respondents (4.64%) were in the low category (score 1–2), 336 respondents (25.97%) in the medium category (score 3), and 898 respondents (69.40%) in the high category (score 4–5). These findings suggest that learning reflection has prompted most teachers to make real changes in their teaching practices.

The Student Understanding Improvement Indicator showed a slightly more widespread distribution: 123 respondents (9.51%) were in the low category, 448 respondents (34.62%) were in the medium category, and 723 respondents (55.87%) were in the high category. Although the high category still dominates, the proportion of the medium category is relatively higher than other indicators, indicating that the impact of reflection on student understanding still needs to be strengthened in some schools. In the Professional Development indicator, only 23 respondents (1.78%) were in the low category and 196 respondents (15.15%) were in the medium category, while 1,075 respondents (83.08%) were in the high category. These results confirm that reflection is one of the important factors in the process of developing teachers' professional competencies.

The Student Engagement Improvement Indicator showed similar results, with 37 respondents (2.86%) in the low category, 199 respondents (15.38%) in the medium category, and 1,058 respondents (81.76%) in the high category. This shows that reflection also plays a role in increasing student participation and activeness in learning. Overall, Table 10 shows that the impact of learning reflection is very strong on teacher professional development and increased student engagement, followed by the impact on changes in teaching practices and student understanding. These findings indicate that reflection is not only a routine activity, but also a strategic function in improving the quality of learning and interaction in the classroom.

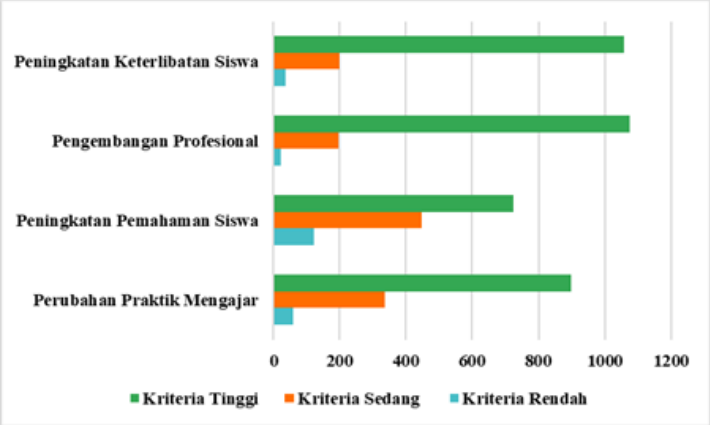


Figure 10. Impact and Utilization of Reflection Results

Figure 10 shows that the impact of reflection is strongest on professional development and student engagement, followed by changes in teaching practices and student understanding. This pattern is consistent with evidence that when reflection is combined with structured professional development (coaching, feedback observation, journal/video reflection), teachers are more likely to make real changes to classroom practice while maintaining improvements (medium-large effects on practice and positive effects on academic achievement) (Kraft, Blazar, & Hogan, 2018; Cirocki, 2024). The impact on student comprehension/learning outcomes is also supported by a meta-analysis that shows the large effect of reflective interventions on achievement, especially when interventions are written, short-term, and accompanied by scaffolding (Zhai, Huang, Ma, & Chen, 2023), as well as longitudinal findings that self-reflection is associated with improved academic performance (Lew & Schmidt, 2011). At the organizational level, professional learning communities (PLCs) that facilitate collective reflection contribute to instructional quality and learning outcomes in line with the dominance of the high category in student engagement in Figure 10 (Vescio, Ross, & Adams, 2008). By design, effective reflective interventions demand structure (guiding questions, formative data, plan–act–observe – reflect cycles) so that reflection does not stop at descriptions but leads to instructional actions (Guo, 2022). The synthesis: (1) the frequency/order of reflection provides the basic capacity; (2) the quality of critical reflection, data-based, and connected to learning decisions transforms capacity into practice change; (3) the PD/PLC ecosystem increases the opportunity for such changes to have an impact on student engagement and understanding. Thus, Figure 10's high profile on professional development and student engagement reflects a combination of individual capacity (self-reflection) and collective leverage (coaching/PLC) that accelerates the translation of reflection into learning outcomes. (Kraft et al., 2018; Cirocki, 2024; Zhai et al., 2023; Lew & Schmidt, 2011; Vescio et al., 2008; Guo, 2022; Kolajo, 2025).

Table 11. Reflection Environment Support

No	Visual	Criterion (%)

		Low	Medium	High
1	Peer Support	2,24	14,06	83,69
2	School Leadership Support	1,70	8,58	89,72
3	Training/Development	1,85	8,04	90,11

Table 11 presents the distribution of frequency and percentage of respondents to the three main aspects of environmental support in the implementation of learning reflection, namely *Peer Support*, *School Leadership Support*, and *Training/Development*. The number of respondents for each indicator was 1,294 people. In the Peer Support indicator, as many as 29 respondents (2.24%) were in the low category (score 1–2), 182 respondents (14.06%) in the medium category (score 3), and 1,083 respondents (83.69%) in the high category (score 4–5). This shows that the majority of teachers feel support from peers, for example through discussions, collaboration, or sharing good practices.

The School Leadership Support Indicator shows a larger proportion of the high category, namely 1,161 respondents (89.72%), with only 22 respondents (1.70%) in the low category and 111 respondents (8.58%) in the medium category. These findings show that the role of school leaders is very strong in encouraging and facilitating the practice of teacher reflection, both structurally and motivationally. Furthermore, the Training/Development indicator became the dimension with the largest high category, namely 1,166 respondents (90.11%), followed by 104 respondents (8.04%) in the medium category and 24 respondents (1.85%) in the low category. These results reflect that the majority of teachers receive adequate professional development support through training, workshops, mentoring, or other reflective forums. In general, Table 11 shows that the work environment of vocational school teachers is very supportive of the implementation of learning reflection, both through peers, school leaders, and professional training and development. This strong environmental support is an important factor that allows reflection practices to take place in a sustainable and meaningful manner, as well as strengthening the learning culture in the school community.

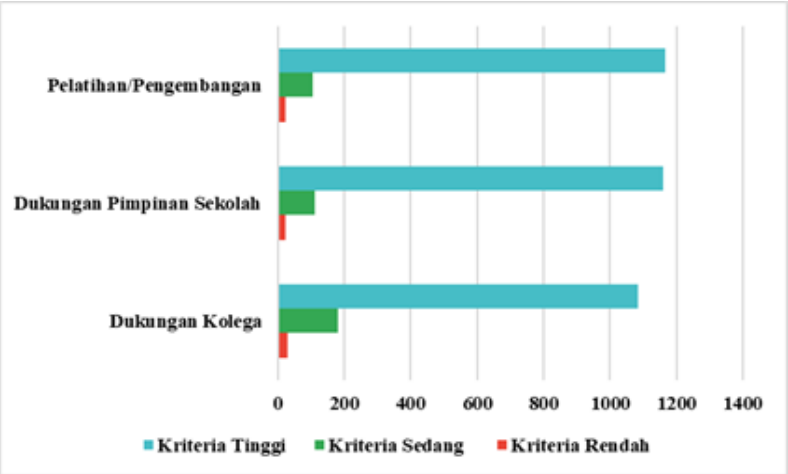


Figure 11. Reflection Environment Support

Figure 11 shows the support of a very strong reflection environment from three sides of colleagues, school leaders, and training/development so that the teacher's work ecosystem is rich in *job resources* (time, feedback, collaboration, instructional leadership) that support reflection and practice change. This pattern is compatible with cross-country findings that structured PLCs are positively correlated with teacher outcomes (efficacy, collaboration, professional learning) and work as a vehicle for data-driven reflection (TALIS 2018) (Christensen, 2025). In the realm of leadership, principals' instructional leadership consistently predicts the intensity of teachers' professional learning providing direction, expectations, and *scaffolding* for routine reflection (He, 2024; also supported by the EMAL study on instructional leadership behaviors that encourage teacher leadership) (He, 2024; Y.-H. Lin et al., 2024). In terms of *job design*, JD-R-based studies show that *job resources* such as autonomy, peer support, and transformational leadership increase learning commitment and frequency of teacher engagement mechanisms that explain why colleague/leader support in Figure 11 is in line with high reflection (Runhaar et al., 2018; Martins et al., 2023).

Furthermore, effective school collaboration (shared time, shared goals, feedback norms) has been shown to enable teachers to move reflection from descriptive to analytical-critical and instructional action (Horn & Little, 2010/2022), while continuous reflective conversations in facilitation programs improve the quality of instruction and learning (Tobin et al., 2024). At the intervention level, coaching/mentoring/supervision has a significant effect on teacher practice (meta-analysis) and becomes a bridge that transforms support into measurable reflective competence (Mok et al., 2021). Finally, the collective efficacy of teachers that grow from meaningful collaboration and supportive leadership is strongly correlated with student achievement, rationalizing that the environmental support in Figure 11 not only strengthens reflection, but also learning outcomes (Lozano et al., 2025).

CONCLUSION

This article concludes that the practice of reflection of vocational teachers is at a high level especially in the practical and critical dimensions with the strongest impact on professional development and increased student engagement; the school ecosystem (peer support, leadership, and training) is also strong so that *the plan–act–observe–reflect* cycle relatively running. However, there is still room for improvement in the allocation of reflection time, consistency of follow-up planning, strengthening the dimension of emotional reflection, and strengthening its impact on student understanding. For this reason, reflection needs to be structured with guiding questions, rubrics, and formative evidence (related to ANBK) and always end with a measurable follow-up plan; Schools should provide scheduled time (e.g. 30–45 minutes/week) and reinforce PLC/coaching (including lesson studies or video reflections) to make reflection more critical and accountable. In terms of policy, it is necessary to set a minimum standard for the reflection cycle per semester along with the allocation of time in the teacher's workload,

budgeting school-based professional development (facilitators, training, and digital reflection platforms) linked to learning quality indicators, and including teacher reflection coaching as an indicator of the principal's instructional leadership performance.

DATA AVAILABLE

The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

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No potential conflict of interest was reported by the authors.

AUTHOR CONTRIBUTION

MZF	Writing -Review & Editing, Methodology, Validation, and Supervision;
F	Conceptualization, Writing -Original Draft, Methodology, Formal analysis, Editing, and Visualization;: Writing -Review & Editing, Validation, and Supervision.

REFERENCES

Akbari, R. (2007). Reflections on reflection: A critical appraisal of reflective practices in L2 teacher education. System, 35(2), 192–207. https://doi.org/10.1016/j.system.2006.12.008

Alshammari, R., & Alrashidi, O. (2025). Investigating teachers' attitudes towards reflection and the frequency of their reflective practices in the Saudi context. Humanities and Social Sciences Communications, 12(1). https://doi.org/10.1057/s41599-025-05374-x

Boud, D., & Walker, D. (1998). Promoting reflection in professional courses: The challenge of context. Studies in Higher Education, 23(2), 191–206. https://doi.org/10.1080/03075079812331380384

BPS. (2024). Jumlah sekolah, guru, dan murid sekolah menengah kejuruan (SMK) di bawah Kemendikdasmen menurut provinsi, 2024/2025 [Tabel statistik]. https://www.bps.go.id/id

Cirocki, A. (2024). Effectiveness of professional development training on reflective teaching practices of English language teachers. Reflective Practice, 25(x), xx–xx. https://doi.org/10.1080/14623943.2024.2384124

Derinalp, P., … (2022). Defining reflective practice from the Indonesian novice EFL teachers' perspective. Reflective Practice, 23(x), xx–xx. https://doi.org/10.1080/14623943.2022.2064445

Direktorat SMK. (2025). Bersiap menuju anbk 2025: smk perkuat pondasi. https://smk.kemendikdasmen.go.id/berita/bersiap-menuju-anbk-2025-smk-perkuat-pondasi-pembelajaran

ElSayary, A., Karaki, S., & Ahmed, R. (2025). Exploring reflective practices in blended learning: a deep dive into educators' in-action and on-action perspectives in interdisciplinary courses. Journal of Information Technology Education: Research, 24. https://doi.org/10.28945/5553

Estaji, M., & Farahian, M. (2023). Development and validation of teacher reflective practice questionnaire. Reflective Practice, 24(x), xx–xx. https://doi.org/10.1080/14623943.2023.2210068

Guo, L. (2022). How should reflection be supported in higher education? A meta-analysis of reflection interventions. Reflective Practice, 23(x), xx–xx. https://doi.org/10.1080/14623943.2021.1995856

Hamel, C. (2019). Using video to support teachers' reflective practice. Cogent Education, 6(1), 1673689. https://doi.org/10.1080/2331186X.2019.1673689

Hatton, N., & Smith, D. (1995). Reflection in teacher education: Towards definition and implementation. Teaching and Teacher Education, 11(1), 33–49. https://doi.org/10.1016/0742-051X(94)00012-U

Haryono, P., Bambang Putut Setyadi, D., & Herawati abcde, N. (2021). Teachers reflective practices and its impact on teaching and learning english in the implementation of merdeka curriculum. Print) Journal of English Language and Education, 10, 2025. https://doi.org/10.31004/jele.v10i4.1176

Jay, J. K., & Johnson, K. L. (2002). Capturing complexity: A typology of reflective practice for teacher education. Teaching and Teacher Education, 18(1), 73–85. https://doi.org/10.1016/S0742-051X(01)00005-18

Jennings, P. A., & Greenberg, M. T. (2009). The prosocial classroom: Teacher social and emotional competence in relation to student and classroom outcomes. Review of Educational Research, 79(1), 491–525. https://doi.org/10.3102/0034654308325693

Kamali, J., & Javahery Tehrany, P. (2024). Collaborative reflection as a means to improve teachers' reflective skills: A community of practice perspective. Reflective Practice, 25(x), xx–xx. https://doi.org/10.1080/14623943.2024.2426279

Kraft, M. A., Blazar, D., & Hogan, D. (2018). The effect of teacher coaching on instruction and achievement: A meta-analysis of the causal evidence. Review of Educational Research, 88(4), 547–588. https://doi.org/10.3102/0034654318759268

Kember, D., McKay, J., Sinclair, K., & Wong, F. K. Y. (2008). A four-category scheme for coding and assessing the level of reflection in written work. Assessment & Evaluation in Higher Education, 33(4), 369–379. https://doi.org/10.1080/02602930701293355

Kolajo, Y. (2025). Advancing pedagogical excellence through reflective practice. Reflective Practice, 26(x), xx–xx. https://doi.org/10.1080/14623943.2025.2504143

Kong, S. C. (2010). Using a web-enabled video system to support student-teachers' self-reflection in teaching practice. Computers & Education, 55(4), 1772–1782. https://doi.org/10.1016/j.compedu.2010.06.006

Korthagen, F., & Vasalos, A. (2005). Levels in reflection: Core reflection as a means to enhance professional development. Teachers and Teaching: Theory and Practice, 11(1), 41–71. https://doi.org/10.1080/1354060042000337093

Kemendikdasmen. (2025). Naskah akademiik pembelajaran koding dan kecerdasan artifisial. https://kurikulum.kemdikbud.go.id/file/1741766787_manage_file.pdf

Larrivee, B. (2008). Development of a tool to assess teachers' level of reflective practice.

Lee, I. (2008). Fostering preservice teachers' reflective practice in teaching journals. System, 36(4), 548–565. https://doi.org/10.1016/j.system.2007.09.007

Lew, M. D. N., & Schmidt, H. G. (2011). Self-reflection and academic performance: Is there a relationship? Medical Education, 45(2), 123–132. https://doi.org/10.1111/j.1365-2923.2010.03899.x

Liesa, E., et al. (2023). Video-Based Feedback for Collaborative Reflection among Pre-Service Teachers. Education Sciences, 13(9), 879. https://doi.org/10.3390/educsci13090879

Loughran, J. J. (2002). Effective reflective practice: In search of meaning in learning about teaching. Journal of Teacher Education, 53(1), 33–43. https://doi.org/10.1177/0022487102053001004

Mann, S., & Walsh, S. (2017). Reflective practice in English language teaching: Research-based principles and practices. Routledge. https://doi.org/10.4324/9781315733395

Nolan, E., & Zeidler, D. (2025). Cultivating critical reflection through socioscientific perspectives. Disciplinary and Interdisciplinary Science Education Research, 7(1). https://doi.org/10.1186/s43031-025-00136-w

OECD. (2025). Reimagining teachers as agents of curriculum change: The OECD Teaching Compass. https://www.oecd.org/content/dam/oecd/en/publications/reports/2025/05/oecd-teaching-compass_5688638f/8297a24a-en.pdf

PSKP. (2024). Peraturan perundang-undangan pendidikan (daftar rujukan normatif: UU 20/2003, PP 57/2021, dst). https://pskp.kemdikbud.go.id/rujukan/

Rahman, A., Nurmahmudah, F., Putra, E. C. S., Harsono, A. M. B., Dewantara, B. A., Arsyad, M. Z. T., & Alfarisa, F. (2025). Artificial intelligence (AI) as the reflective partner: Empowering teachers for deep learning pedagogy. RIGGS: Journal of Artificial Intelligence and Digital Business, 4(3), 3877–3889. https://doi.org/10.31004/riggs.v4i3.2426

Richter, E., Hußner, I., Huang, Y., & Richter, D. (2022). Video-based reflection in teacher education: Comparing virtual reality and real classroom videos. Computers & Education, 190, 104601. https://doi.org/10.1016/j.compedu.2022.104601

Soisangwarn, A., & Wongwanich, S. (2014). Promoting the reflective teacher through peer coaching to improve teaching skills. Procedia – Social and Behavioral Sciences, 116, 2504–2511. https://doi.org/10.1016/j.sbspro.2014.01.601

Tanner, K. D. (2023). Reflective practices in education: A primer for practitioners. CBE—Life Sciences Education, 22(x), xx–xx. https://doi.org/10.1187/cbe.22-07-0148

Vescio, V., Ross, D., & Adams, A. (2008). A review of research on the impact of professional learning communities on teaching practice and student learning. Teaching and Teacher Education, 24(1), 80–91. https://doi.org/10.1016/j.tate.2007.01.004

Zhai, N., Huang, Y., Ma, X., & Chen, J. (2023). Can reflective interventions improve students' academic achievement? A meta-analysis. Thinking Skills and Creativity, 49, 101373. https://doi.org/10.1016/j.tsc.2023.101373

Zhou, X., Shu, L., Xu, Z., & Padrón, Y. (2023). The effect of professional development on in-service STEM teachers' self-efficacy: A meta-analysis of experimental studies. International Journal of STEM Education, 10, 37. https://doi.org/10.1186/s40594-023-00422-x