

Managing the Implementation of the Merdeka Curriculum Education for Sustainable Development through an Evaluation Study in Educational Practice

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ABSTRACT

The integration of Education for Sustainable Development (ESD) within vocational education remains inconsistently implemented, particularly under Indonesia's Merdeka Curriculum. This study evaluates how ESD principles are incorporated into the Accounting and Financial Institution program at SMK Muhammadiyah 1 Prambanan Klaten. A descriptive qualitative design was applied using the CIPP model. Data were collected through interviews, classroom observations, and document analysis involving school leaders, teachers, and students, and analyzed using interactive techniques with triangulation. The findings show that institutional vision and industry collaboration support ESD integration, and teachers have received relevant training; however, infrastructure limitations persist. Learning practices adopt student-centered and project-based approaches, yet implementation varies and supervision is limited. Although students meet technical competency standards, sustainability awareness and long-term career alignment remain weak. The study highlights the need to strengthen coherence between curriculum policy, pedagogical practice, and sustainability-oriented learning outcomes in vocational education.

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1. Introduction.

The global education agenda has increasingly emphasized the role of schools in addressing sustainability challenges, including climate change, social inequality, and economic instability. Through Education for Sustainable Development (P. Glavič, 2020), education systems are expected to equip learners with competencies that integrate cognitive, socio-emotional, and behavioral dimensions for responsible decision-making (Kalterina Shulla et al, 2020). Within this framework, vocational education holds a strategic position because it directly prepares students for participation in economic systems that significantly affect environmental and social sustainability (Dora Smolčić Jurdana and R. Agbaba, 2023).

Recent studies indicate that integrating ESD into vocational curricula requires contextual adaptation, industry collaboration, and transformative pedagogy (Forsler et al., 2024; C. Marouli, 2021).

In Indonesia, curriculum reform through the Merdeka Curriculum aims to promote flexible, competency-based, and project-oriented learning (Cholilah et al., 2023; Widyastuti, 2022). The curriculum emphasizes autonomy, differentiated learning, and stronger alignment with industry needs. However, national learning outcomes remain a concern. The OECD (2023) reported declining performance trends in Indonesia's Programme for International Student Assessment 2022 results in reading, mathematics, and science, highlighting persistent structural challenges. Beyond academic achievement, vocational graduates are also expected to demonstrate sustainability awareness and adaptive career competencies (Mustajib; Agus Zaenul Fitri, 2023; Sari, 2021; Mulyasa, 2021).

The challenges of education in the era of globalization are not limited to academic achievements alone. The world today is facing complex issues such as environmental crises, climate change, social inequality, and economic instability (Jian Wang et al., 2011). Therefore, education is required not only to produce graduates who are intellectually capable but also sensitive to sustainability issues (Yangbin Jin, 2023). Quality education must be able to instill values of sustainability, social responsibility, and decision-making skills based on ethics and environmental sustainability. In this context, the Education for Sustainable Development (ESD) approach becomes highly relevant to be integrated into the education system, particularly through the curriculum (C. Wolhuter and E. Niemczyk, 2023; Ozéias Rocha et al, 2023).

UNESCO (2017) defines ESD as an educational approach that enables learners to acquire the knowledge, skills, values, and attitudes needed to make responsible decisions and take effective actions for a sustainable future. ESD encompasses the three main dimensions of sustainable development, namely social, economic, and environmental (Li-Ching Hung and Hsiang-Ju Pan, 2025). The implementation of ESD in the curriculum aims for learners not only to understand sustainability issues but also to be able to internalize these values in their daily lives and social environment (Marie Weiss et al, 2021).

However, the implementation of ESD in Indonesia is still not optimal. Research by Vioeza et al. (2023) shows that ESD-based learning is still trapped in the cognitive or knowledge aspect alone, while the attitude and skills dimensions have not received adequate attention. This condition occurs due to teachers' limited understanding, minimal support from educational resources, and the lack of contextual and interdisciplinary learning strategies (Daniel Olsson et al, 2022). On the other hand, vocational education, such as Vocational High Schools (SMKs), faces its own challenges in integrating ESD into skill-based learning oriented towards the workforce (A. Alshawi et al, 2023).

Eveliina Asikainen and Annukka Tapani (2021) The integration of Education for Sustainable Development (ESD) in vocational education not only requires teachers' conceptual understanding but also changes in pedagogical approaches that are contextual to the working world. Forsler et al. (2024) emphasize that implementing ESD in vocational education requires curriculum adaptation and learning methodologies to be relevant to the dynamic realities of industry as well as the local needs of students (Caleb Chidozie Chinedu et al, 2023). In their study at Swedish vocational schools, it was found that teachers who successfully internalized sustainability values generally applied experiential and participatory approaches (G. Cebrián et al, 2020).

Vocational education plays a strategic role in producing graduates who are job-ready, skilled, and oriented toward real-world work practices (Mulyasa, 2021). However, work readiness cannot be measured solely by technical mastery (Rochmad Novian Inderanata and T. Sukardi, 2023). The current industrial and job market demand graduates who have environmental awareness, collaborative skills, and critical thinking abilities to solve complex problems related to sustainability (Sari, 2021). Therefore, the integration of ESD (Education for Sustainable Development) into vocational education has become an urgent need, and the curriculum must serve as the main platform to achieve it (Rintatik Wahyuningsih et al, 2025).

SMK Muhammadiyah 1 Prambanan Klaten is one of the private vocational schools in Central Java that has fully implemented the Independent Curriculum across all grade levels since the 2024/2025 academic year. The school offers four areas of expertise, one of which is the Accounting and Institutional Finance (AKL) program. Based on initial observations conducted by the researcher, there are several

challenges in the implementation of the Merdeka Curriculum at this school (Nur 'Azah et al, 2024), such as the broad scope of the curriculum, limited teaching materials and infrastructure, as well as the increased workload of teachers (Intan Cahya et al, 2025). In addition, teachers' readiness in designing and implementing project-based learning and integrating ESD still needs to be improved (Wulan Ndari et al, 2023).

The Creative Projects and Entrepreneurship (PKK) program, as part of the Merdeka Curriculum, is actually geared towards developing sustainable entrepreneurial skills (Yu Shu et al, 2020). Through this program, students are guided to develop products or services that are both economically valuable and environmentally friendly, as well as relevant to sustainability issues (B. Pasi et al, 2025). This aligns with the mission of ESD (C. Pardo-Garcia and M. Barac, 2020), which encourages students to become agents of change by making responsible decisions regarding the social and environmental impacts of economic activities (Ferawati, 2018; Tilbury, 2011).

Nevertheless, it is necessary to evaluate the effectiveness of the implementation of the Merdeka Curriculum in integrating the principles of ESD in a tangible way in schools (Hardiyanti Pratiwi et al, 2025), especially at the vocational education level. Evaluation is important because it can provide factual, objective, and systematic information regarding the successes as well as the shortcomings of the implemented policy (Rahayu & Aly, 2023; Yoto et al., 2024). One relevant evaluation model in this context is the CIPP model (Context, Input, Process, Product) developed by Stufflebeam. This model facilitates an in-depth analysis of various components in the implementation of education policy.

This study aims to evaluate the implementation of the Merdeka Curriculum policy in the application of Education for Sustainable Development (ESD) in the Accounting and Institutional Finance Expertise Program at SMK Muhammadiyah 1 Prambanan Klaten using the CIPP evaluation model. The evaluation is conducted on the aspects of context (policy readiness and support), input (resources and teacher competencies), process (learning strategies and ESD approach), and product (learning achievements and impact on students) (Ahmed G. Abo-Khalil, 2024). This evaluation is expected to identify both the successes and challenges faced by educational units in implementing a sustainability-oriented curriculum (L. Nguyen et al, 2025; Carmen Castaño et al, 2025).

The selection of SMK Muhammadiyah 1 Prambanan Klaten as the research site is based on its uniqueness, urgency, and strategic potential. As a private school actively implementing the Merdeka Curriculum despite limited resources, this school provides a realistic picture of the dynamics and challenges of implementing national education policies (Alaa Aldowaish et al, 2022). In addition, the AKL Expertise Program at this school offers space for exploring the integration of ESD into accounting, finance, and entrepreneurship practices (M. Cerciello et al, 2022).

This study offers novelty in three respects. First, it integrates curriculum policy evaluation with sustainability education analysis using the CIPP model as a holistic evaluative framework (Birsal Aybek and Osman Oğuz, 2025). Second, it situates ESD within an Accounting and Financial Institution (AKL) vocational program, a field rarely examined in sustainability curriculum research despite its relevance to economic decision-making and responsible financial practices (Oktavianto et al., 2023). Third, it provides context-specific evidence from a private vocational school implementing the Merdeka Curriculum under resource constraints, contributing to policy-relevant insights for similar institutions (Jiyanto et al, 2024; Bambang Afriadi and Fitri Fitri, 2025).

Therefore, this study aims to evaluate the implementation of the Merdeka Curriculum in integrating Education for Sustainable Development within the Accounting and Financial Institution program at SMK Muhammadiyah 1 Prambanan Klaten using the CIPP model. Specifically, the study examines (1) contextual readiness and institutional alignment with ESD principles, (2) input factors including teacher competence and infrastructure support, (3) pedagogical processes in classroom implementation, and (4) short- and long-term educational outcomes related to sustainability-oriented competencies.

2. Research method

This study employed a descriptive qualitative design using the CIPP model (Context, Input, Process, Product) developed by Stufflebeam as the evaluative framework. The qualitative approach was selected to obtain an in-depth understanding of how Education for Sustainable Development (ESD) principles are operationalized within the implementation of the Merdeka Curriculum in a vocational

education setting. The CIPP model enables systematic examination of policy implementation from institutional readiness to educational outcomes (Nurrahman et al., 2023; Rahayu & Aly, 2023).

The research was conducted at SMK Muhammadiyah 1 Prambanan Klaten, Central Java, Indonesia. The site was selected purposively due to its full implementation of the Merdeka Curriculum across grade levels in the 2024/2025 academic year and its active collaboration with industry partners. Data collection was carried out from August to November 2025, covering one academic semester to capture ongoing instructional processes and program outcomes.

Participants consisted of key stakeholders directly involved in curriculum implementation: the school principal (1), vice principal for curriculum (1), head of the Accounting and Financial Institution (AKL) program (1), productive AKL teachers (4), and students from grades X, XI, and XII (12 students representing different achievement levels). A purposive sampling technique was applied to ensure that informants possessed relevant knowledge and decision-making roles related to curriculum planning, implementation, and evaluation. Student participants were selected using maximum variation sampling to represent diverse academic performance and engagement levels.

The primary research instrument was the researcher, supported by structured and semi-structured interview guides aligned with the four CIPP components. Observation checklists were developed to document pedagogical practices, ESD integration, and classroom interaction patterns. Document analysis protocols were used to examine curriculum documents, Learning Objective Flow (ATP), Teaching Modules, supervision reports, and competency assessment records. Instrument development referred to CIPP evaluation indicators adapted to vocational and ESD contexts (Nurrahman et al., 2023).

Data were collected through three techniques: 1) Semi-structured interviews with school leaders, teachers, and students to explore perceptions, experiences, and implementation challenges. 2) Non-participant classroom observations to document instructional practices, student engagement, and sustainability-related integration. 3) Document analysis of curriculum planning documents, assessment reports, industry collaboration records, and supervision documentation. Data collection followed an iterative process, allowing preliminary findings to inform subsequent interviews and observations.

Data were analyzed using the interactive model of Miles, Huberman, and Saldaña (2014), consisting of data condensation, data display, and conclusion drawing/verification. Coding was conducted deductively based on CIPP categories and inductively to capture emerging themes related to ESD integration. Cross-component comparison was performed to identify alignment or discrepancies between policy intention and classroom practice.

To ensure methodological rigor, this study applied trustworthiness criteria as proposed by Lincoln and Guba (1985). 1) Credibility was established through source triangulation (leaders, teachers, students) and method triangulation (interviews, observations, documents). Member checking was conducted by returning summarized findings to selected participants for confirmation. 2) Dependability was ensured through an audit trail documenting research procedures, coding decisions, and analytical memos. 3) Confirmability was strengthened by maintaining reflexive notes to minimize researcher bias and by storing raw data systematically for verification. 4) Transferability was supported by providing thick descriptions of the institutional context, participant characteristics, and implementation conditions to enable contextual comparison with similar vocational schools.

3. Research Results

This study aims to evaluate the implementation of the Merdeka Curriculum policy in the context of Education for Sustainable Development (ESD) in the Accounting and Financial Institution Expertise Program at SMK Muhammadiyah 1 Prambanan, Klaten. The evaluation was conducted using the CIPP model (Context, Input, Process, Product). Based on the study results involving interviews, observations, and document studies, several key findings related to the implementation of the policy were identified.

Table 1. Results of the Merdeka Curriculum Evaluation in ESD Implementation

Evaluation Components	Findings
<i>Context</i>	- The school's vision and mission support ESD (moral, independent, superior,

Evaluation Components	Findings
	Islamic). - The curriculum is synchronized with DUDI at the beginning of each new school year. - There are street vendor activities, entrepreneurship, outing classes that are in line with continuous education. - The Merdeka curriculum is considered flexible but complex by teachers. - Challenge: student motivation and integration of ESD values are still low.
<i>Input</i>	- AKL's productive teachers have participated in training and certification (LSP, MGMP, workshop). - The principal supports the professional development of teachers on an ongoing basis. - Preparation of ATP and Teaching Modules based on CP and DUDI input. - Major obstacles in learning facilities and infrastructure (projectors, printers, internet networks). - Innovation is carried out with industry visits, <i>outing classes</i> , and field practices.
<i>Process</i>	- Active learning with project-based learning, discovery learning, problem-based learning. - Digital accounting practice (MYOB, Excel), practice at Bank Mini BNI. - The difference in the ability of young and senior teachers causes inequality in implementation. - Supervision is only carried out once a year, so it is not optimal enough. - Practical teaching materials (<i>worksheets</i>) are limited, students' motivation to learn is low.
<i>Product</i>	- All students in class XII are declared competent in UKK and have achieved KKTP. - Entrepreneurial practices and street vendors have a positive impact on technical skills. - The long-term outcome is not optimal: graduates work a lot outside the field. - Sustainability awareness is still low; ESD values have not been internalized. - The main challenge: strengthening career orientation and affective aspects.

3.1 Context Evaluation Results

The context evaluation results indicate that SMK Muhammadiyah 1 Prambanan has a vision and mission that support the principles of ESD, namely to develop graduates who are moral, independent, excellent, and Islamic. The Merdeka Curriculum in the AKL program is synchronized with the Business and Industrial World (DUDI) at the beginning of each academic year, especially in the preparation of the Learning Objective Flow (ATP) and Teaching Modules (MA). The school also carries out supporting activities such as a six-month Field Work Practice (PKL), entrepreneurship, and outing classes that are relevant to sustainable education.

Nonetheless, teachers view the Merdeka Curriculum as a flexible yet complex curriculum. The main challenge in the context component is the low learning motivation of students and the suboptimal integration of ESD values explicitly into the learning process.

3.2 Input Evaluation Results

In the input component, research results show that productive AKL teachers have participated in various trainings and competency certifications, such as the Merdeka Curriculum training, MGMP workshops, as well as LSP certification. The principal provides support for the continuous professional development of teachers. The preparation of ATP and Teaching Modules is carried out based on Learning Outcomes (CP) and input from DUDI.

However, the limited facilities and infrastructure have become the main obstacles. The availability of projectors, printers, and internet networks is still inadequate to support digital-based

learning. To overcome these limitations, schools and teachers innovate in teaching through industrial visits, outing classes, and field practice.

3.3 Process Evaluation Results

The evaluation results of the process show that learning in the AKL program has implemented active learning models, such as project-based learning, discovery learning, and problem-based learning. Students are involved in digital accounting practice using MYOB and Excel, as well as financial service practice at BNI Mini Bank.

However, the implementation of learning has not been uniform. There is a difference in ability between young teachers and senior teachers in implementing the Merdeka Curriculum, particularly in the use of technology and learning innovations. Learning supervision is only conducted once a year, so it has not been optimal in supporting the improvement of the learning process quality. In addition, the limited availability of practical teaching materials and the low learning motivation of students also affect the effectiveness of learning.

3.4 Product Evaluation Results

The product evaluation results show that all twelfth-grade students in the AKL program are deemed competent in the Competency Skill Test (UKK) and have achieved the Learning Achievement Criteria (KKTP). Industrial Work Practice (PKL) and entrepreneurship practice activities have had a positive impact on improving students' technical skills.

However, the long-term outcomes are not yet optimal. Most graduates work outside the AKL field of expertise. In addition, students' awareness and understanding of sustainability values are still low, so the internalization of ESD has not been fully achieved.

4. Discussion.

4.1 Context Evaluation

The context evaluation indicate that institutionally SMK Muhammadiyah 1 Prambanan possesses normative readiness to integrate Education for Sustainable Development (ESD) within the Merdeka Curriculum framework. The alignment between the school's vision emphasizing independence, excellence, and Islamic values and sustainability principles reflects what UNESCO (2017) conceptualizes as value-based transformation in education. Furthermore, curriculum synchronization with the Business and Industrial World (DUDI) demonstrates contextual responsiveness, which is essential in vocational education (Dirgantara et al., 2025; Yoto et al., 2024). This suggests that at the policy and structural level, the school has established an enabling environment for ESD integration. However, the findings also reveal that such alignment remains largely declarative and has not yet been systematically translated into explicit sustainability-oriented learning objectives, indicators, and assessment frameworks.

When compared with previous studies, these results reinforce patterns identified by Nurrahman et al. (2023), who found that implementation of the Merdeka Curriculum in vocational schools often shows formal compliance at the contextual level but lacks deep pedagogical internalization. Similarly, Vioreza et al. (2023) reported that ESD integration in Indonesia tends to remain at the cognitive-policy discourse stage rather than affecting classroom transformation. The present study extends these findings by demonstrating that even in schools with strong industry collaboration and institutional commitment, the operationalization of ESD values into measurable curriculum components remains limited. In this respect, the study both confirms prior research and adds contextual evidence from an Accounting and Financial Institution (AKL) program, a field rarely examined in ESD-based vocational curriculum evaluation (Oktavianto et al., 2023).

From a theoretical perspective, the results partially support the assumptions of the CIPP model proposed by Stufflebeam, which posits that contextual clarity and institutional alignment are foundational prerequisites for effective program implementation (Nurrahman et al., 2023; Rahayu & Aly, 2023). While contextual alignment exists normatively, the findings suggest that contextual readiness alone is insufficient to guarantee transformative educational outcomes. This diverges from linear interpretations of the CIPP logic model and instead supports Weiss et al. (2021), who argue that embedding sustainability

requires systemic curriculum restructuring rather than symbolic alignment. Thus, the study strengthens the theoretical argument that context must move beyond vision statements toward operational policy instruments and sustainability benchmarks.

The gap between institutional vision and classroom integration can be explained by several interacting factors. First, teachers perceive the Merdeka Curriculum as flexible yet complex, creating cognitive overload that limits their capacity to explicitly embed ESD values (Ndari et al., 2023; Cahya et al., 2025). Second, student motivation remains low, which reduces the effectiveness of sustainability discourse in learning activities. Third, sustainability has not yet been framed as a measurable competency within the AKL program's core performance indicators. These conditions indicate that ESD is treated as complementary rather than integral to vocational competence, particularly in accounting education where technical mastery tends to dominate (Sari, 2021; Mulyasa, 2021). Consequently, sustainability remains peripheral in practical curriculum enactment.

Theoretically, this study contributes by refining the understanding of "context" within the CIPP framework in sustainability-oriented vocational education. Context should not merely be interpreted as institutional vision or policy alignment, but as the presence of structured sustainability mandates, explicit curriculum mapping, and measurable indicators integrated into program design. By situating ESD within an accounting vocational program, this study expands sustainability curriculum discourse beyond environmental or general education fields and demonstrates its relevance to economic decision-making and responsible financial practices (Cerciello et al., 2022). This contextual repositioning contributes to bridging sustainability theory and vocational economic education.

Practically, the findings imply the need for strategic strengthening at the contextual level through formal ESD policy integration into curriculum documents (ATP and Teaching Modules), development of sustainability-based learning outcomes specific to accounting practices, and clearer performance indicators related to ethical financial decision-making and social responsibility. Schools should also institutionalize sustainability benchmarks within DUDI collaboration agreements to ensure that industry alignment includes environmental and social responsibility dimensions (Forsler et al., 2024; Nguyen et al., 2025). Without such structured reinforcement, the Merdeka Curriculum risks functioning as an adaptive administrative reform rather than as a transformative instrument for sustainability-oriented vocational education.

4.2 Input Evaluation

The findings of the input evaluation indicate that human resource readiness at SMK Muhammadiyah 1 Prambanan is relatively strong, particularly in terms of teacher competence and professional development. Productive teachers in the Accounting and Financial Institution (AKL) program have participated in Merdeka Curriculum training, MGMP workshops, and LSP certifications, suggesting that the school has invested in strengthening pedagogical and technical capacities. This condition reflects a positive alignment between curriculum reform demands and teacher qualification upgrading. However, the adequacy of human resources is not matched by sufficient infrastructural support, especially in digital facilities such as projectors, printers, and stable internet access. Thus, the interpretation of the findings suggests a structural imbalance: while competence-based readiness exists at the individual level, systemic resource constraints limit the optimal enactment of ESD-oriented learning within the Merdeka Curriculum framework.

When compared with previous research, these findings are consistent with Nurrahman et al. (2023), who emphasized that teacher preparedness is a significant enabling factor in implementing the Independent Curriculum, yet institutional resource limitations often reduce implementation effectiveness. Similarly, Santi and Maureen (2024) identified infrastructural inadequacy as a recurring structural barrier in vocational schools adopting the Merdeka Curriculum. The present study reinforces these conclusions by demonstrating that even when professional development initiatives are sustained by school leadership, the absence of adequate technological infrastructure constrains innovation in digital accounting practice and sustainability integration. Moreover, the findings complement Ndari et al. (2023), who argue that curriculum reform success depends not only on policy dissemination but also on operational readiness at the school level.

From a theoretical standpoint, the results support the core assumption of the CIPP evaluation framework that input quality comprising human, material, and organizational resources determines the

feasibility of achieving program objectives (Rahayu & Aly, 2023; Nurrahman et al., 2023). However, this study extends the theoretical interpretation of “input” by highlighting the necessity of balance between human capital and infrastructural capital. While classical interpretations of input within CIPP emphasize availability, the findings suggest that proportional alignment among input components is equally critical. In this regard, the study aligns with systemic perspectives on curriculum change that view reform as an ecosystem requiring synchronized development of teacher competence, institutional leadership, and technological infrastructure (Weiss et al., 2021).

The imbalance observed in this study can be explained by several contextual factors. First, as a private vocational institution operating under resource constraints, budget allocation for digital infrastructure may not be sufficient to fully support technology-intensive accounting instruction. Second, rapid curriculum reform under the Merdeka framework may have prioritized teacher training as an immediate strategy, while infrastructural upgrading requires longer-term financial planning. Third, vocational accounting education increasingly depends on digital applications such as MYOB and Excel, making technological limitations more visible compared to other programs (Sari, 2021). Consequently, although teachers possess improved competencies, their ability to translate ESD principles into digitally supported, project-based sustainability learning remains partially constrained.

Theoretically, this study contributes by refining the conceptualization of input evaluation within sustainability oriented vocational education. It argues that input readiness must be interpreted multidimensionally not only as teacher qualification but also as digital ecosystem preparedness that enables sustainability literacy and ethical financial simulation practices (Cerciello et al., 2022). By situating the analysis within an AKL vocational program, the study broadens sustainability discourse into the domain of accounting education, an area often underexplored in ESD implementation research (Oktavianto et al., 2023). This contributes to bridging vocational economic training with sustainability competencies.

Practically, the findings imply that policy interventions should adopt an integrated investment strategy. Continuous teacher professional development must be accompanied by systematic upgrading of digital infrastructure to support sustainability-based project learning and financial simulation practices. School leaders should also explore stronger DUDI partnerships not only for curriculum synchronization but for resource-sharing mechanisms, including access to updated accounting software and industry-standard digital tools (Yoto et al., 2024). Without strengthening infrastructural inputs, the transformative potential of trained teachers may not fully materialize, thereby limiting the realization of the Merdeka Curriculum as a vehicle for sustainability-oriented vocational education.

4.3 Process Evaluation

The results of the process evaluation indicate that classroom implementation within the Accounting and Financial Institution (AKL) program has adopted student-centered approaches aligned with the Merdeka Curriculum framework, particularly through project-based learning, discovery learning, and problem-based learning. These strategies reflect pedagogical characteristics consistent with Education for Sustainable Development (ESD), which emphasize experiential, contextual, and participatory learning (Forsler et al., 2024; Cebrián et al., 2020). The integration of digital accounting practices using MYOB and Excel, as well as simulations at the Mini Bank BNI, demonstrates efforts to situate learning within authentic professional contexts. However, despite these promising practices, implementation remains inconsistent across teachers, and sustainability values are not yet systematically embedded in learning objectives, classroom discourse, or assessment criteria. Thus, the interpretation of the findings suggests that while pedagogical models are structurally compatible with ESD, their transformative depth remains limited.

When compared with previous research, these findings reinforce the argument of Dirgantara et al. (2025) that project-based learning under the Merdeka Curriculum can strengthen vocational students’ work readiness. However, this study extends that perspective by revealing that work-readiness orientation does not automatically translate into sustainability orientation. Similarly, Pratiwi et al. (2025) found that ESD integration within the Merdeka Curriculum depends heavily on how teachers operationalize sustainability principles in daily instructional practices. The inconsistency observed between younger and

senior teachers in this study also aligns with Ndari et al. (2023), who reported disparities in technological adaptation and innovation capacity among educators implementing curriculum reform. Therefore, the present findings confirm prior studies while highlighting a critical gap between methodological adoption and sustainability internalization.

From a theoretical perspective, the results both support and refine the CIPP framework. Within the CIPP logic, the process component functions as the central mechanism linking input readiness to product outcomes (Nurrahman et al., 2023; Rahayu & Aly, 2023). The findings affirm this proposition: although teacher competence (input) is relatively adequate, uneven implementation and minimal supervision weaken the translation of these inputs into sustainable learning outcomes. At the same time, the study supports Weiss et al. (2021), who argue that sustainability integration requires coherent curriculum enactment processes rather than isolated innovative practices. Thus, effective process implementation demands not only methodological alignment but also structured monitoring, collaborative reflection, and sustainability-focused evaluation criteria.

Several contextual factors help explain why the process dimension has not yet fully achieved transformative impact. First, supervision is conducted only once a year, limiting formative feedback and pedagogical refinement. Second, disparities in digital literacy between younger and senior teachers create uneven classroom experiences, particularly in technology-integrated accounting instruction. Third, sustainability has not yet been explicitly framed as an assessment benchmark, leading teachers to prioritize technical competency achievement (UKK and KKTP) over affective and ethical dimensions (Novi et al., 2024; Sari, 2021). Consequently, although active learning models are implemented, sustainability values tend to remain implicit rather than explicitly cultivated.

Theoretically, this study contributes by emphasizing that process evaluation in sustainability-oriented vocational education must examine not only instructional methods but also the depth of value integration and supervision intensity. It proposes that methodological innovation alone is insufficient; structured pedagogical coherence and reflective monitoring are necessary to ensure sustainability internalization. By situating this analysis within an accounting vocational context, the study expands ESD discourse into financial simulation and ethical accounting practice, areas that are strategically important yet underexplored in sustainability pedagogy research (Oktavianto et al., 2023; Cerciello et al., 2022).

Practically, the findings suggest several strategic implications. Schools should strengthen academic supervision systems through more frequent formative monitoring and peer-collaborative lesson reflection to ensure consistent ESD integration. Professional learning communities (MGMP-based collaboration) can be utilized to harmonize pedagogical innovation across teachers. Additionally, sustainability indicators should be explicitly embedded within project rubrics, financial simulations, and reflective assignments to ensure that ethical decision-making, environmental awareness, and social responsibility are assessed alongside technical accounting skills (Forsler et al., 2024; Nguyen et al., 2025). Without strengthening the coherence and monitoring of instructional processes, the Merdeka Curriculum risks remaining methodologically progressive yet substantively limited in advancing sustainability-oriented vocational education.

4.4 Product Evaluation

In terms of product components, the research results show that the implementation of the Merdeka Curriculum within the AKL program has been effective in achieving short-term academic and technical outcomes. All Grade XII students were declared competent in the Competency Skill Test (UKK) and achieved the Minimum Learning Achievement Criteria (KKTP), indicating strong performance in measurable vocational standards. In addition, entrepreneurship activities and Field Work Practice (PKL) contributed positively to the development of practical accounting skills and workplace adaptability. From this perspective, the Merdeka Curriculum appears successful in fulfilling its immediate mandate of strengthening competency-based vocational outputs (Dirgantara et al., 2025; Yoto et al., 2024). However, the findings also reveal that sustainability awareness and long-term career alignment within the accounting field remain limited, suggesting that technical competence does not automatically translate into sustainability-oriented professional identity.

When compared with previous research, these results are consistent with Novi et al. (2024), who found that curriculum implementation in Indonesia tends to achieve cognitive and psychomotor targets more effectively than affective and value-based dimensions. Similarly, Vioreza et al. (2023) reported that

ESD integration often emphasizes knowledge transmission rather than internalization of sustainability attitudes and behaviors. The present study reinforces these conclusions by demonstrating that although vocational students meet formal competency benchmarks, the deeper transformation envisioned in Education for Sustainable Development such as ethical financial responsibility and sustainability-conscious decision-making has not been fully realized. Furthermore, the finding that many graduates work outside their field of expertise aligns with concerns raised by Sari (2021) regarding career mismatch challenges in vocational accounting education.

From a theoretical standpoint, the results both affirm and extend the CIPP model's logic. In the CIPP framework, the product component assesses both intended and unintended outcomes of program implementation (Nurrahman et al., 2023; Rahayu & Aly, 2023). While intended academic outputs have been achieved, unintended gaps appear in sustainability internalization and long-term career coherence. This finding supports Weiss et al. (2021), who argue that sustainability embedding requires deep structural integration into learning culture rather than surface-level program inclusion. Moreover, the findings resonate with UNESCO's (2017) conceptualization of ESD, which emphasizes cognitive, socio-emotional, and behavioral transformation. The current outcomes suggest that the cognitive and technical dimensions are stronger than the socio-emotional and behavioral dimensions within the AKL program.

Several contextual factors explain why sustainability-oriented product outcomes remain suboptimal. First, assessment systems primarily emphasize technical mastery (UKK and KKTP), leaving limited space for evaluating sustainability values, ethical reasoning, or environmental accountability in financial decision-making. Second, career guidance mechanisms may focus more on employment access than on aligning graduates with sustainability driven accounting pathways. Third, as indicated in the process findings, sustainability principles are not yet explicitly embedded into measurable learning indicators, resulting in weak reinforcement at the outcome stage (Pratiwi et al., 2025; Ndari et al., 2023). Consequently, while the curriculum produces competent graduates, it does not yet consistently cultivate sustainability conscious professionals.

Theoretically, this study contributes by distinguishing between "technical vocational competence" and "sustainability-integrated vocational competence." It argues that within sustainability-oriented curriculum reform, product evaluation must move beyond certification results and examine value internalization, ethical reasoning capacity, and long-term career trajectories. By situating ESD within accounting and financial education, this research expands sustainability discourse into economic literacy and responsible financial governance, areas highlighted as crucial for sustainable business practices (Cerciello et al., 2022; Oktavianto et al., 2023). This reconceptualization enriches vocational ESD evaluation literature by incorporating economic-ethical dimensions into product assessment.

Practically, the findings imply that vocational schools should integrate sustainability-based assessment frameworks alongside existing competency standards. Authentic assessment models such as sustainability-oriented financial case analysis, reflective journals on ethical accounting practices, and community-based entrepreneurship projects can strengthen affective and behavioral outcomes (Forsler et al., 2024; Nguyen et al., 2025). In addition, career guidance programs should incorporate sustainability career mapping to align graduates with responsible financial institutions and socially accountable enterprises. Without recalibrating product indicators toward sustainability transformation, the Merdeka Curriculum risks producing technically competent graduates who are insufficiently prepared to contribute to long-term sustainable economic development.

5. Conclusion

This study aimed to evaluate the implementation of the Merdeka Curriculum in integrating Education for Sustainable Development (ESD) within the Accounting and Financial Institution program at SMK Muhammadiyah 1 Prambanan using the CIPP model. The findings demonstrate that contextual and input dimensions show relatively strong institutional readiness, particularly in terms of vision alignment, industry collaboration, and teacher professional development. However, the process dimension reveals uneven pedagogical implementation and limited supervision, while the product dimension indicates that outcomes remain concentrated on technical competency achievement rather than

sustainability value internalization. Overall, the study confirms that vocational curriculum reform requires systemic coherence across policy, resources, instructional practice, and assessment orientation.

The main contribution of this research lies in refining the application of the CIPP evaluation model within sustainability-oriented vocational accounting education by distinguishing between technical vocational competence and sustainability-integrated competence. Practically, schools are encouraged to embed explicit ESD indicators into curriculum planning, supervision mechanisms, and assessment systems. Future research should adopt longitudinal and mixed-method approaches to explore long-term sustainability competencies, ethical financial literacy, and graduate career alignment in vocational education contexts.

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