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Assessment of Needs for Industrial Class Models Based on Work Culture in SMKs Across Makassar

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ABSTRACT

Research Aims: Vocational High Schools (SMKs) in Indonesia face persistent challenges in graduate employability, with only 60% of SMK graduates successfully entering the labor market. This study addresses the critical gap between educational outcomes and industry requirements, particularly in work culture competencies.

Design/methodology/approach: To analyze the needs for implementing a work culture-based industrial class model in vocational high schools across Makassar City. A mixed-methods approach using the ADDIE framework was employed, involving 320 students, 45 teachers, 12 industry partners, and administrators from four SMKs. Data collection included surveys, interviews, document analysis, and observations. Structural Equation Modeling (SEM) analyzed relationships between variables

Research Findings: Significant gaps were identified in work culture integration, with 68% of teachers lacking industry experience and 74% of students feeling unprepared for workplace ethics. SEM analysis revealed that experimental learning experiences (β=0.529, $p<0.001$) and instructor quality (β=0.293, p=0.002) significantly influence perceived employability.

Theoretical Contribution/Originality: The proposed model achieved expert validation with a mean validity score of 3.65. A comprehensive work culture-based industrial class model was developed featuring hybrid learning approaches (50% school-based, 50% industry-based), collaborative teaching, and authentic assessment mechanisms

Keywords: work culture, industrial class model, vocational education, SMK, employability, industry partnership, ADDIE framework, experimental learning, Makassar

Introduction

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Vocational High Schools (Sekolah Menengah Kejuruan, SMK) in Indonesia are pivotal in preparing students for the workforce by equipping them with technical skills aligned with industry demands. However, despite their strategic role, SMK graduates often face challenges in securing employment due to persistent gaps between educational outcomes and industrial requirements. In 2025 data from University of Indonesia's Institute for Economic and Social Research (LPEM) entitled "Indonesia Economic Outlook Q2–2025 compares economic conditions and employment during major crises, such as the Asian financial crisis in 1997-1998, the global financial crisis in 2008, and the Covid-19 pandemic in 2020-2022. This discrepancy underscores systemic issues, including outdated curricula, insufficient industry collaboration, and a lack of emphasis on work culture—a critical component of modern industrial environments.

Makassar, a rapidly industrializing city in South Sulawesi, exemplifies this challenge. As a regional economic hub, Makassar's industries demand a workforce proficient not only in technical skills (hard skills) but also in workplace ethics, teamwork, problem-solving, and adaptability (soft skills). These competencies, collectively termed work culture, are rarely integrated into SMK curricula, leaving graduates ill-prepared for the realities of industrial workplaces. Existing models of industrial classes in SMKs, such as teaching factories and industry partnerships, often prioritize technical training over cultural acclimatization, resulting in a mismatch between graduate capabilities and employer expectations (Mahendra et al., 2023).

This study introduces a novel framework by integrating industrial work culture into the pedagogical structure of vocational high schools (SMKs)—a dimension often overlooked in existing industrial class models. While previous research has largely emphasized technical skill development through teaching factories and industry partnerships, this study uniquely focuses on embedding soft skills such as discipline, teamwork, adaptability, and workplace ethics directly into the curriculum design, teaching methods, and teacher training of SMK programs. By taking Makassar as a case study, this research pioneers a localized and work culture-based model of vocational education, offering strategic insights into how SMKs in rapidly industrializing urban centers can better prepare graduates not just for jobs, but for long-term industrial integration. This approach not only bridges the existing disconnect between SMK graduates and labor market expectations but also redefines the role of vocational education in fostering culturally and professionally competent industrial workers.

This study addresses the urgent need to reorient SMK education toward a work culture-based industrial class model. By analyzing the requirements for such a model in Makassar's SMKs, this research aims to bridge the gap between vocational education and industry needs. The study focuses on three dimensions:

1. Curriculum Alignment: Integrating industrial work culture into pedagogical frameworks.
2. Industry Collaboration: Strengthening partnerships to reflect real-world workplace norms.
3. Teacher Preparedness: Equipping educators to deliver work culture-centric instruction.

The findings will inform policymakers, educators, and industry stakeholders on designing SMK programs that produce graduates who are both technically proficient and culturally attuned to modern workplaces.

Literature Review

Vocational Education and the Imperative of Work Culture

Vocational education globally has shifted from purely technical training to holistic workforce development. The World Economic Forum (2020) in (Soleh et al., 2023) emphasizes that 50% of employees require reskilling to meet evolving job demands, with soft skills like communication and adaptability becoming as critical as technical expertise. In Indonesia, SMKs are mandated to adopt a link and match approach, ensuring curricula align with industry needs. However, implementation remains fragmented. A 209 World Bank report highlights that underinvestment in vocational training and weak industry-school partnerships hinder SMKs from fulfilling this mandate.

Work culture, encompassing values such as punctuality, discipline, communication, teamwork, and adherence to workplace norms, has become a critical factor in determining graduates' employability in industrial settings.

🔹 1. Importance and Definition of Work Culture in SMK Context

Work culture is defined as a set of shared values, beliefs, practices, and codes of conduct that govern workplace behaviour (OECD, 2023; UNESCO-ILO, 2016). In the context of vocational education, this culture is ideally cultivated through structured interactions with industry, behavioral modeling, and simulation of workplace environments (Anderson, 2021).

(Calen et al., 2022) emphasize that discipline, time management, teamwork, and compliance with SOPs are often lacking in SMK graduates, leading to dissatisfaction among employers. This aligns with ILO-UNESCO (2016) findings, which highlight a global gap between technical competence and workplace readiness in vocational education systems.

🔻 2. Implementation in Advanced Vocational Systems

Japan's Kosen Colleges of Technology emphasize shūkan-ka or habitualization of work behavior. Students undergo multi-year training with embedded internships, where soft skills and ethics are emphasized alongside technical mastery (Nada & Ubaidillah, 2023).

Germany's Dual Vocational Education and Training (VET) system mandates 50% of learning time in real-world company environments, where trainees adapt to company culture, hierarchical discipline, and peer collaboration (Euler, 2017).

In Singapore, the Institute of Technical Education (ITE) includes modules on workplace communication, adaptability, and even resilience training, embedded in courses from year one (Varaprasad, 2021).

These international models consistently demonstrate that embedding work culture into vocational education results in higher job retention rates and reduced employer onboarding costs (OECD, 2023).

🔻 3. Comparison with Traditional Technical Approaches in Indonesia

While SMK programs in Indonesia include Teaching Factory (Tefa) and industrial internships (Prakerin), studies (Suwandi et al., 2023) show these primarily emphasize technical procedures and production skills. Work culture is often treated as incidental, lacking systematic integration into curriculum, lesson planning, or teacher evaluation standards.

(Mohamad et al., 2024) found that SMK students struggle with adaptability and teamwork in post-graduation employment, which employers perceive as critical shortcomings. These findings are echoed in the Ministry of Manpower's tracer studies (Kemnaker, 2023), which show a 40% mismatch between graduate profiles and industry expectations, partly due to behavioral gaps.

Existing Industrial Class Models in SMKs

SMKs in Indonesia have experimented with industrial class models, such as:

- Teaching Factories: Schools replicate industrial production lines to provide hands-on experience.
4. Industry Partnerships: Collaborative programs where students intern at companies.
5. Competency-Based Training (CBT): Focused on achieving skill standards set by industries.

While these models improve technical proficiency, they often neglect work culture. For example, SMK Negeri 2 Palembang's industrial classes reported a 78% improvement in problem-solving skills but lacked emphasis on workplace ethics. Similarly, (Suroto et al., 2023) found that SMK graduates in Central Java excelled in machine operation but struggled with teamwork and communication in industrial settings.

The ADDIE model (Analysis, Design, Development, Implementation, Evaluation) has been proposed to systematize curriculum development. In Makassar, SMK Negeri 5's use of ADDIE for industrial classes highlighted the need for work culture integration during the Analysis and Design phases to ensure cultural competencies are prioritized.

Challenges in Implementing Work Culture-Based Models

Several barriers impede the adoption of work culture-centric models in SMKs:

- Curriculum Rigidity: SMK curricula are often theory-heavy, leaving little room for soft skill development. A 2022 study in Makassar found that 70% of SMK lesson plans focused on technical tasks, with only 0% addressing workplace communication.
6. Industry Disengagement: Companies frequently view partnerships as philanthropic rather than strategic. For instance, PT Samsung International Indonesia's collaboration with SMK Negeri 2 Makassar faced delays due to misaligned expectations about student readiness.
7. Teacher Capacity: Many SMK instructors lack industry experience. A 202-survey revealed that only 30% of Makassar's SMK teachers had undergone industrial internships, limiting their ability to model workplace norms.

Toward a Work Culture-Driven Framework

Successful models abroad offer insights. Germany's dual system integrates work culture through mandatory internships supervised by industry mentors, while Singapore's Institute of Technical Education (ITE) embeds workplace ethics into competency assessments (Zehr & Korte, 2020; Zhang & and Schmidt-Hertha, 2020). In Indonesia, SMK Negeri Surabaya's Industry-Based Learning program, developed with PT Telkom, reduced graduate unemployment by 40% by incorporating SOP adherence and teamwork into evaluations (Ananda et al., 2024).

Theoretical frameworks like Work Culture-Based Training (WCBT) emphasize three pillars:

- Skill Development: Aligning technical training with industry tools and processes.
8. Behavioral Competencies: Cultivating discipline, responsibility, and adaptability.
9. Cultural Immersion: Simulating real-world workplace dynamics through projects and internships.

While existing studies highlight the importance of work culture, few provide actionable frameworks for SMKs. Research in Makassar has focused on technical skill gaps, neglecting cultural dimensions. This study fills this gap by conducting a needs analysis to design a work culture-based industrial class model tailored to Makassar's industrial landscape.

Research Methodology

This study employs a mixed-methods approach to comprehensively analyze the needs for a work culture-based industrial class model in vocational high schools (SMKs) across Makassar City. The research integrates quantitative surveys and qualitative interviews to capture diverse stakeholder perspectives, institutional readiness, and systemic challenges (Lake et al., 2021). Grounded in the ADDIE framework (Analysis, Design, Development, Implementation, Evaluation), the methodology prioritizes the Analysis phase to identify gaps between existing industrial class practices and industry demands (Cheng, 2024). This phase is critical for aligning educational outcomes with workplace cultural competencies such as discipline, teamwork, and adherence to Standard Operating Procedures (SOPs), which are often overlooked in SMK curricula.

The instruments used in this study consisted of a semi-structured interview guide for vocational teachers, school principals, and industry representatives, as well as a closed-ended questionnaire based on a Likert scale for vocational high school (SMK) students. The content validity of the instruments was assessed through expert judgment involving three specialists in vocational education and industry, who provided feedback on the clarity and relevance of each item. After revisions were made based on their input, the instruments were empirically tested in a pilot study involving 30 respondents. The results of the validity test indicated that all questionnaire items had item-total correlations greater than 0.30. Additionally, the reliability test yielded a Cronbach's Alpha coefficient of 0.87, indicating a high level of internal consistency.

The study targets four SMKs in Makassar (SMK Negeri 2, 3, 5, and 10), selected through purposive sampling based on their active participation in industrial class programs and partnerships with local industries. The sample includes 320 students from technical and industrial programs (e.g., mechanical engineering, informatics), 45 teachers involved in industrial class instruction, 2 industry partners from manufacturing and IT sectors, 8 school administrators, and 4 policymakers from the Makassar Education Office. Stratified random sampling ensured representation across grades and specializations, while industry partners were chosen based on their collaboration history with the schools. This approach ensures a holistic understanding of the interplay between educational practices and industrial expectations.

Data collection utilized triangulated methods to enhance validity. A 5-point Likert scale questionnaire assessed perceptions of work culture integration, curriculum relevance, and industry collaboration (Doherty & Stephens, 2020; Koro & Hagger-Vaughan, 2025). The instrument covered three dimensions: work culture components (discipline, teamwork), curriculum alignment (industry input in syllabus design), and infrastructure adequacy (tools matching industry standards). Reliability tests yielded a Cronbach's alpha of 0.87, confirming high internal consistency. Semi-structured interviews with teachers, industry representatives, and administrators explored barriers such as rigid curricula and teacher unpreparedness, while also identifying success factors from existing models like SMK Negeri 5's collaboration with PT Telkom. Interviews were transcribed and coded for thematic analysis to uncover systemic inefficiencies.

Document analysis complemented primary data by reviewing SMK curricula, industry partnership agreements, and policy documents like Makassar's 2023 Vocational Education Revitalization Plan. This revealed misalignments between educational outputs and labor market needs, such as outdated machinery in 60% of schools. Observations of classroom and workshop activities further evaluated the integration of work culture elements, including punctuality and problem-solving simulations. These observations highlighted disparities between theoretical instruction and real-world workplace dynamics.

Quantitative analysis employed Structural Equation Modeling (SEM) using SmartPLS 3.0 to test relationships between variables like work culture training, teacher capacity, and employability. Key metrics included outer loadings >0.70 (indicator reliability), composite reliability of 0.89–0.93 (internal consistency), and Average Variance Extracted (AVE) >0.50 (convergent validity). Descriptive statistics revealed that 68% of teachers lacked industry immersion experience, and 74% of students felt unprepared for workplace ethics. Qualitative findings from thematic analysis identified three core challenges: curriculum-industry disconnect (limited industry involvement in syllabus updates), teacher competency gaps (only 30% with

industrial internship experience), and infrastructure limitations (60% of schools lacking modern machinery). Triangulation of these results confirmed that low intrinsic motivation ($\beta = -0.4$) correlated with outdated teaching methods reported in interviews.

Ethical considerations included obtaining informed consent from all participants, anonymizing data, and sharing aggregated findings with industry partners to avoid proprietary concerns. Limitations encompassed geographic specificity (findings context-bound to Makassar), sample bias (overrepresentation of technical programs), and self-reporting biases in surveys. To address these, expert validation involved academic reviewers assessing methodological rigor and industry practitioners evaluating practical recommendations. Pilot testing with 30 students and 5 teachers refined survey instruments, ensuring clarity and relevance.

The ADDIE framework's iterative structure allowed for systematic identification of intervention points, such as enhancing teacher-industry collaboration and modernizing infrastructure. For instance, SMK Negeri 5's use of ADDIE underscored the need to prioritize cultural competencies during the Analysis and Design phases. This mixed-methods approach not only bridges quantitative and qualitative insights but also provides actionable strategies for aligning SMK programs with industrial work culture. Subsequent phases will leverage these findings to develop a tailored model, ensuring graduates possess both technical proficiency and cultural adaptability.

Results and Discussion

Result

The analysis of work culture-based industrial class model needs across Vocational High Schools (SMKs) in Makassar City revealed substantial gaps between current educational practices and industry requirements. This comprehensive study involved four key vocational schools (SMK Negeri 2, 3, 5, and 10), 320 students, 45 teachers, 12 industry partners, 8 school administrators, and 4 policymakers from the Makassar Education Office. The mixed-methods approach yielded rich quantitative and qualitative data that identified critical needs across six dimensions: curriculum alignment, teacher capacity, industry collaboration, infrastructure, implementation framework, and work culture integration.

The findings demonstrate that while existing industrial class programs show promise, they require significant restructuring to effectively integrate work culture elements essential for workplace readiness. Statistical analysis through Structural Equation Modeling (SEM) confirmed that experimental learning experiences ($\beta=0.529$, $p<0.001$) and instructor quality ($\beta=0.293$, $p=0.002$) significantly influence

students' perceived employability, emphasizing the importance of authentic workplace experiences and qualified instructors in developing industry-ready graduates.

1. Current State of Industrial Classes in Makassar's Vocational Schools

The current implementation of industrial classes across Makassar's vocational schools follows varied approaches with inconsistent standards and outcomes. While schools like SMK Negeri 10 Makassar have established partnerships with companies such as Samsung for electronics programs, many others maintain only perfunctory industry connections that fail to provide authentic workplace experiences. These implementation patterns range from minimal industry involvement (consisting primarily of occasional guest lectures) to more comprehensive programs featuring curriculum co-development and internship opportunities.

Data revealed that only 30% of vocational teachers had undergone industrial internships, significantly limiting their ability to model workplace behaviors and integrate work culture elements into their teaching. Additionally, 70% of lesson plans focused predominantly on technical tasks, with only 10% addressing workplace communication and professional conduct essential to work culture development.

Physical infrastructure assessment revealed that 60% of workshops and laboratories contained equipment that was outdated or no longer aligned with current industry standards. This technological gap creates significant barriers to authentic workplace simulation and leaves students unprepared for contemporary industrial environments. The disparity is particularly pronounced in rapidly evolving fields such as information technology, electronics, and automation, where industry standards frequently outpace educational resources.

A survey of industry partners highlighted concerns regarding the gap between classroom learning and workplace realities, with 74% of industry representatives noting that graduates required extensive retraining in basic operational procedures and professional conduct. This retraining represents a significant cost burden for employers and undermines the value proposition of vocational education as a direct pathway to employment.

2. Needs Analysis Based on ADDIE Framework

The analysis phase revealed critical gaps between current educational practices and industry expectations regarding work culture integration. Interviews with industry representatives identified seven core work culture elements considered essential for workplace success: discipline and punctuality, teamwork, adherence to standard operating procedures (SOPs), problem-solving capabilities, communication skills,

adaptability, and professional ethics. These elements were often underdeveloped in vocational graduates despite their central importance to workplace success.

Stakeholder interviews further revealed a fundamental misalignment in expectations, with schools primarily focusing on technical competency development while industry partners emphasized the importance of workplace behaviors and attitudes. This misalignment was evidenced by assessment practices that evaluated technical skills while neglecting work culture dimensions such as teamwork efficacy, communication competence, and adherence to professional standards.

Based on analysis findings, the design phase identified requirements for a comprehensive work culture-based industrial class model. These included the need for:

- Integrated curriculum that balances technical skills (50%) with work culture development (50%)
- Modular learning structures that allow for regular updates aligned with evolving industry standards
- Assessment frameworks that evaluate both technical competencies and work culture dimensions
- Project-based learning approaches that simulate authentic workplace challenges and team dynamics
- Clear delineation of roles between school instructors and industry practitioners

Industry partners emphasized the importance of developing students' capacity to function effectively within workplace hierarchies, collaborate in diverse teams, and adapt to organizational cultures—competencies rarely addressed in traditional vocational curricula. These partners further advocated for learning experiences that mirror actual workplace conditions, including adherence to timelines, quality standards, and professional communication protocols.

The development phase identified requirements for creating effective learning materials and environments that integrate work culture dimensions. These needs included:

- Context-rich case studies drawn from actual industry scenarios
- Simulation exercises that require students to navigate workplace protocols and interpersonal dynamics

- Comprehensive training modules for teachers on facilitating work culture development
- Collaborative project development with industry partners to ensure authenticity
- Detailed guidelines for industry immersion programs

The findings emphasized the importance of developing materials that not only teach what work culture entails but also provide opportunities for students to practice and internalize these behavioral patterns. Development needs further included creating resources that help teachers transition from traditional instructor roles to facilitators of work culture learning.

Implementation phase analysis revealed several critical requirements for successfully operationalizing the work culture-based industrial class model. These included:

- Phased implementation strategy with clear milestones and evaluation points
- Comprehensive teacher training on facilitating work culture development
- Structured involvement of industry practitioners in teaching and mentoring
- Clear mechanisms for ongoing feedback and continuous improvement
- Creation of school environments that simulate workplace conditions

Stakeholder interviews highlighted concerns about implementation challenges, particularly regarding teacher readiness and institutional capacity to maintain industry-standard facilities. Both school administrators and industry partners emphasized the need for structured implementation protocols that ensure consistency across different vocational schools.

Analysis of evaluation needs identified requirements for assessing the effectiveness of the work culture-based industrial class model. These included:

- Comprehensive frameworks for assessing work culture competency development
- Protocols for gathering and incorporating industry feedback
- Methods for evaluating teacher effectiveness in facilitating work culture learning
- Systems for tracking graduate employment outcomes and workplace performance
- Mechanisms for continuous model refinement based on evaluation results

Industry partners particularly emphasized the importance of assessment authenticity, advocating for evaluation methods that mirror actual workplace performance reviews rather than traditional academic assessments. This requires developing evaluation instruments that capture not only what students know but how they apply this knowledge within professional contexts.

3. Structural Equation Modeling Analysis Results

The measurement model demonstrated strong psychometric properties, with most indicators showing outer loadings above the 0.7 threshold, indicating good individual item reliability. Composite reliability values for all constructs exceeded 0.9, demonstrating excellent internal consistency. Average variance extracted (AVE) values ranged from 0.594 to 0.843, with most constructs exceeding 0.7—well above the 0.5 minimum threshold—confirming strong convergent validity.

Discriminant validity assessment using the Fornell-Larcker criterion confirmed that constructs were empirically distinct, though some high cross-loadings between Experimental Learning Experience and Perceived Instructor Quality (0.829) suggested conceptual overlap in these areas. Two indicators in the Intrinsic Motivation construct (INT_MOT7: 0.343 and INT_MOT8: 0.391) showed problematically low loadings, indicating potential measurement issues that require refinement in future research.

Structural model evaluation revealed substantial explanatory power, with the model accounting for 68.7% of variance in Intrinsic Motivation (R^2=0.687) and 82.6% of variance in Perceived Employability (R^2=0.826). Path analysis identified several significant relationships crucial for understanding the dynamics of work culture development and employability in vocational education.

Experimental Learning Experience emerged as the strongest predictor of Perceived Employability (β=0.529, t=6.448, $p<0.001$), followed by Instructor Quality (β=0.293, t=3.069, p=0.002) and Attitude (β=0.213, t=2.340, p=0.019). These findings emphasize the critical importance of authentic workplace experiences, qualified instructors, and positive student attitudes in developing employability skills.

Interestingly, Intrinsic Motivation showed a negative, though non-significant, relationship with Perceived Employability (β=-0.139, t=1.644, p=0.100), contrary to theoretical expectations. This unexpected finding may reflect the complex relationship between internal motivation and external performance standards in workplace contexts, suggesting that intrinsic motivation alone may be insufficient without proper channeling through structured work experiences.

Effect size analysis (f^2) indicated that Experimental Learning Experience had a moderate effect on Perceived Employability (f^2=0.233), while other predictors

showed small effects. This underscores the paramount importance of authentic workplace experiences in developing students' perception of their employability.

4. Work Culture Integration Needs

Analysis identified six essential work culture components that require systematic integration into the industrial class model. These components include:

- Discipline and Professional Conduct: Punctuality, adherence to deadlines, and professional appearance and behavior
- Teamwork and Collaboration: Ability to work effectively in diverse teams and contribute to collective goals
- Procedural Adherence: Following standard operating procedures and workplace protocols
- Problem-solving and Initiative: Proactively identifying and addressing workplace challenges
- Communication Competence: Professional communication across hierarchical levels and with diverse stakeholders
- Adaptability and Continuous Learning: Willingness to adapt to changing conditions and continuously develop skills

Industry partners particularly emphasized the importance of these "soft skills," noting that technical deficiencies could be remediated through training, while deficiencies in work culture competencies often led to early termination. The findings revealed that 78% of industry representatives considered work culture competencies equally important to technical skills when evaluating potential employees.

The research identified several mechanisms necessary for effectively integrating work culture elements into the industrial class model. These include:

- Explicit Learning Outcomes: Work culture competencies must be articulated as explicit learning outcomes with clear assessment criteria
- Modeling and Mentoring: Teachers and industry practitioners must consistently model workplace behaviors and provide mentoring on professional conduct

- Authentic Assessment: Evaluation methods must assess work culture competencies through workplace-authentic tasks rather than theoretical questions
- Progressive Development: Work culture competencies should be developed progressively, moving from structured guidance to autonomous practice
- Reflective Practice: Students need structured opportunities to reflect on and internalize work culture experiences

Stakeholders emphasized that work culture integration should not be treated as a separate curriculum component but rather woven throughout all aspects of the industrial class experience. This requires systematic planning and coordination between school instructors and industry practitioners to ensure consistent messaging and expectations.

5. Model Validation Results

The proposed work culture-based industrial class model underwent rigorous expert validation, achieving a mean validity score of 3.65 (on a 4-point scale) with a "Very Valid" classification. Experts evaluated five key aspects: theoretical foundation, structural components, operational feasibility, implementation guidance, and assessment mechanisms. All dimensions received scores above 3.5, indicating strong expert consensus regarding the model's validity.

Expert feedback highlighted three areas for refinement: ensuring consistency in terminology usage throughout model documentation, improving layout and visual elements in the implementation guidebook, and enhancing the design of instructional materials. These recommendations were incorporated into subsequent model revisions to strengthen clarity and usability.

The implementation guidebook, which operationalizes the model for practitioners, received a mean validity score of 3.27 with a "Very Valid" classification. Evaluation across four dimensions—model design alignment (3.17), supporting materials (3.38), language use (3.33), and presentation quality (3.21)—confirmed the guidebook's overall validity while identifying specific areas for improvement.

Expert recommendations focused on clarifying formative assessment instructions, improving cover design elements, and developing differentiated versions for various stakeholders (teachers, industry partners, and administrators). These recommendations informed subsequent revisions to enhance the guidebook's utility for different user groups.

6. Implementation Experiences

Initial implementation with 3 teachers and 17 students at SMK Negeri 10 Makassar provided valuable insights into model functionality and early implementation challenges. Participant feedback highlighted four key areas requiring attention: more explicit integration of work culture elements in curriculum materials, better balance between theoretical and practical learning activities, development of more authentic assessment methods, and strengthening mechanisms for industry participation.

Teachers particularly noted challenges in facilitating work culture development, citing limited personal industry experience and lack of specific training in workplace socialization approaches. Students responded positively to work culture elements but expressed concerns about the gap between school facilities and actual workplace environments.

Expanded implementation with 60 students revealed additional insights, particularly regarding infrastructure limitations and teacher preparation needs. Findings highlighted significant gaps between school equipment and industry standards, requiring creative approaches to simulate contemporary workplace environments despite resource limitations. Teachers identified needs for additional training specifically focused on facilitating work culture development rather than merely technical instruction.

An important observation was that industry practitioners, while knowledgeable about workplace requirements, often lacked pedagogical skills necessary for effective teaching. This highlighted the need for bidirectional professional development: workplace exposure for teachers and pedagogical training for industry practitioners.

The full field trial involving 30 students demonstrated the model's overall applicability while identifying specific implementation challenges. Participants reported high model applicability and moderate implementation ease, with 87% of students reporting improved work readiness following participation. The learning environment was characterized as more interactive, innovative, and independent compared to traditional vocational instruction.

Implementation challenges primarily concerned scheduling coordination between schools and industry partners, maintaining consistent quality across different implementation sites, and developing teacher capacity to facilitate authentic workplace simulations. Despite these challenges, overall results supported the model's effectiveness in enhancing work culture competencies and employability skills.

7. Proposed Work Culture-Based Industrial Class Model

Based on comprehensive needs analysis and validation results, the proposed work culture-based industrial class model features four key structural elements:

Hybrid Learning Approach: Balanced distribution with 50% school-based learning (30% theory, 70% practice) and 50% industry-based learning focused on authentic workplace experiences

Collaborative Teaching: Integration of school teachers (60%) focusing on theoretical foundations and industry practitioners (40%) focusing on technical skills and workplace culture

Progressive Experiential Learning: Six-month industry immersion organized in a rotating system where 50% of students remain at school while 50% participate in industry placements

Authentic Assessment: Joint evaluation by school and industry representatives using industry-aligned job sheets, professional competency tests, and work culture evaluation rubrics

This structure addresses identified needs by creating a balanced approach that systematically develops both technical competencies and work culture dimensions. The model's emphasis on authentic workplace experiences responds directly to the finding that experimental learning was the strongest predictor of perceived employability.

The model incorporates work culture through five specific mechanisms designed to ensure systematic competency development:

- Explicit Work Culture Objectives: Each learning module includes explicit work culture objectives alongside technical competency goals
- Workplace Simulation: School-based activities simulate workplace conditions, including adherence to industry timelines, quality standards, and communication protocols
- Industry Mentoring: Industry practitioners provide structured mentoring focused specifically on workplace norms and professional conduct
- Reflective Practice: Students engage in structured reflection activities to process and internalize workplace experiences
- Authentic Assessment: Evaluation methods mirror actual workplace performance reviews, assessing both technical and work culture dimensions

These mechanisms ensure that work culture development is not treated as an add-on but is systematically integrated throughout the learning experience. This integration addresses the critical gap identified in current practices where work culture development is often neglected despite its importance to workplace success.

Discussion

The research findings make several important contributions to vocational education theory. First, they empirically validate the critical role of authentic workplace experiences in developing employability skills, supporting experiential learning theories that emphasize the importance of direct engagement with professional contexts. The strong relationship between experimental learning and perceived employability ($\beta=0.529$) underscores the limitations of classroom-based instruction alone in preparing students for workplace success.

Second, the findings challenge simplistic understandings of motivation in vocational education. The unexpected negative (though non-significant) relationship between intrinsic motivation and perceived employability suggests that workplace readiness may depend less on general motivation and more on specific behavioral patterns aligned with workplace expectations. This highlights the importance of channeling student motivation through structured experiences that explicitly develop work culture competencies.

Third, the research extends Work Culture-Based Training (WCBT) theory by operationalizing its principles within a comprehensive educational model. While previous WCBT research focused primarily on workplace training, this study demonstrates how its principles can be systematically integrated into formal vocational education through a structured industrial class model.

The findings have significant implications for vocational education practice in Makassar and beyond. The identified needs for curriculum revision, teacher development, industry partnership, and infrastructure improvement provide a comprehensive roadmap for enhancing vocational education's alignment with workplace requirements.

The validated model offers a practical framework that educational institutions can adapt to their specific contexts, providing clear guidance on balancing school and industry learning, integrating work culture development, and implementing authentic assessment. The implementation experiences provide valuable insights into potential challenges and strategies for addressing them, supporting more effective model adoption.

For industry partners, the findings highlight the importance of active engagement in vocational education beyond traditional internship programs. The model's emphasis

on collaborative teaching, curriculum co-development, and joint assessment creates structured pathways for meaningful industry involvement that benefits both educational institutions and employers.

The research findings have important implications for vocational education policy at local and national levels. They highlight the need for policies that support systematic work culture integration through curriculum standards that explicitly include workplace behavior competencies alongside technical skills. Current policies that focus predominantly on technical competencies may inadvertently perpetuate the gap between education and workplace expectations.

The findings also emphasize the importance of teacher professional development policies that support industry immersion experiences. With only 30% of current vocational teachers having industry experience, policies are needed to facilitate regular industry exposure for educators. Similarly, policies supporting industry practitioner involvement in teaching can enhance the authenticity of vocational education.

Infrastructure development policies must address the significant gap between school facilities and industry standards, with 60% of schools using outdated equipment. The findings suggest that rather than attempting to match industry in all equipment, policy might better focus on creating strategic partnerships that provide students with access to current technology through industry placements.

Conclusion

The comprehensive needs analysis revealed significant gaps in current industrial class implementations across Makassar's vocational schools, particularly regarding systematic work culture integration. The validated work culture-based industrial class model addresses these gaps through a balanced approach that combines school and industry learning, collaborative teaching, progressive experiential learning, and authentic assessment.

Vocational schools must undertake comprehensive curriculum reform to explicitly integrate work culture competencies alongside traditional technical skills training. This integration requires a fundamental shift in educational approach, moving beyond purely technical instruction to encompass the soft skills and professional behaviors essential for workplace success. Additionally, schools should invest significantly in teacher professional development programs that focus specifically on industry immersion and work culture facilitation. These programs will ensure that educators possess both current industry knowledge and the pedagogical skills necessary to effectively transmit workplace culture concepts to students. Furthermore, vocational institutions must develop structured industry partnership

frameworks that support collaborative teaching methodologies and authentic assessment practices, creating meaningful connections between classroom learning and real-world application.

Industry partners play a crucial role in enhancing vocational education effectiveness and must engage more systematically in educational processes through collaborative teaching, curriculum development, and assessment activities. This engagement should extend beyond traditional internship programs to include direct participation in classroom instruction and curriculum design. Companies should provide structured mentoring programs that focus specifically on workplace culture and professional conduct, ensuring that students understand not only technical requirements but also the behavioral expectations and cultural norms of their chosen industries. Additionally, industry partners should actively participate in teacher professional development initiatives by facilitating industry immersion experiences, allowing educators to gain firsthand knowledge of current workplace practices and emerging industry trends.

Policymakers must establish comprehensive curriculum standards that explicitly include work culture competencies as mandatory components of vocational education programs. These standards should clearly define the specific workplace behaviors, professional ethics, and cultural competencies that students must demonstrate upon program completion. Government support for teacher professional development programs focused on industry immersion is essential, requiring dedicated funding and policy frameworks that encourage and facilitate educator-industry exchanges. Finally, policymakers should actively facilitate infrastructure development through innovative partnership models that bring together educational institutions, industry partners, and government agencies in collaborative arrangements that benefit all stakeholders while improving educational outcomes for students.

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