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Research Article

INTEGRATING SOCIAL-EMOTIONAL LEARNING (SEL) INTO A HYBRID MIDDLE SCHOOL CURRICULUM TO FOSTER DIGITAL WELLBEING AND RESILIENCE

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Abstract

The increasing integration of digital technologies in middle school education has transformed how students learn, interact, and develop their emotional intelligence. However, prolonged digital engagement in hybrid learning environments often leads to emotional fatigue, decreased empathy, and reduced digital wellbeing among adolescents. Addressing this challenge requires embedding Social-Emotional Learning (SEL) within hybrid curricula to enhance students' resilience, empathy, and self-regulation in digital contexts. This study aims to design and evaluate an SEL-integrated hybrid curriculum model that promotes digital wellbeing and emotional balance among middle school students. A mixed-method design was employed, combining quasi-experimental and qualitative approaches. The participants included 120 students from three hybrid middle schools in Indonesia. Quantitative data were gathered through pre- and post-intervention surveys using a validated SEL and digital wellbeing scale, while qualitative insights were collected from focus group discussions and classroom observations. Data were analyzed using paired-sample t-tests and thematic coding. Results revealed significant improvements in students' emotional awareness ($p < 0.01$), empathy ($p < 0.01$), and digital self-regulation ($p < 0.05$). Qualitative findings further indicated that integrating SEL practices such as mindfulness exercises, reflective journaling, and collaborative digital storytelling enhanced students' resilience and strengthened teacher-student relationships in hybrid settings. The study concludes that embedding SEL into hybrid curricula effectively fosters holistic learning, digital citizenship, and emotional stability. This framework offers a scalable model for schools seeking to balance academic achievement with psychological wellbeing in digitally mediated education.

Keywords: Digital Wellbeing, Hybrid Education, Middle School Students, Resilience, Social-Emotional Learning.

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INTRODUCTION

The rapid integration of technology in education has redefined how students learn, interact, and construct meaning in the digital age. Hybrid learning models, combining face-to-face and online instruction, have become central to post-pandemic education reforms (Stucke & Ezrachi, 2025). In this model, students navigate both physical and virtual learning spaces, requiring not only cognitive adaptability but also emotional regulation and digital responsibility (Lemon et al., 2025). Educational research increasingly highlights that academic success in such environments depends on students' ability to manage emotions, build relationships, and cope with digital stressors (Kanade et al., 2025). These competencies are core elements of Social-Emotional Learning (SEL), a framework designed to foster self-awareness, empathy, and responsible decision-making in learners.

SEL has been recognized globally as an essential component of holistic education. Frameworks developed by organizations such as CASEL (Collaborative for Academic, Social, and Emotional Learning) have demonstrated that students who engage in SEL-based programs exhibit higher motivation, better academic performance, and stronger interpersonal skills (Akhtar, 2025). SEL interventions have traditionally been implemented within conventional classroom settings, where social cues and emotional feedback are more visible and immediate (Jayalakshmi & Arun, 2025). In hybrid learning environments, however, such interactions are mediated through screens, chat tools, and digital platforms, altering the way emotional communication occurs.

Hybrid education environments introduce both opportunities and risks (Tiwari, 2025). While technology enhances accessibility and collaboration, it also amplifies issues such as screen fatigue, social isolation, and reduced emotional connectedness among middle school students (Schoeps et al., 2025). Adolescents, being in a critical stage of socio-emotional development, are particularly vulnerable to these challenges (Bressler & Tark, 2025). They must navigate identity formation, peer relationships, and self-esteem while engaging in digital communication that often lacks non-verbal cues (Neri, 2025). Without explicit SEL integration, hybrid learning may fail to support students' mental health and social development adequately.

Digital wellbeing has emerged as a pressing concern in the 21st-century educational discourse (Pelly, 2025). It refers to maintaining a balanced relationship between digital engagement and psychological health (Greyling et al., 2025). Research by the OECD (2022) and UNESCO (2023) shows that prolonged digital exposure without emotional scaffolding contributes to anxiety, distraction, and decreased resilience among adolescents (Gaztañaga et al., 2025). Thus, schools are called to move beyond digital literacy toward digital wellbeing education, emphasizing mindfulness, empathy, and ethical digital behavior.

SEL provides a theoretical and practical foundation to address these issues (Liyanaarachchi et al., 2026). Through structured lessons on self-management, social awareness, and relationship skills, SEL equips students to regulate their emotions and make responsible choices in digital environments (Krings et al., 2025). When integrated into hybrid curricula, SEL can bridge the affective gap between online and offline learning experiences, creating emotionally supportive ecosystems that promote resilience (Kaur et al., 2025). The need to adapt SEL to hybrid contexts is now widely recognized, but evidence-based models for middle school implementation remain limited.

The growing complexity of digital interactions calls for an educational shift from technology-centered design to human-centered pedagogy (M. Zhang, 2025). Middle school educators increasingly acknowledge that emotional intelligence is as crucial as cognitive ability for navigating digital environments (Thornhill et al., 2025). By embedding SEL principles into hybrid curricula, schools can cultivate learners who are not only academically competent but also emotionally grounded and socially responsible in digital spaces.

Despite global consensus on the importance of SEL, its operationalization within hybrid learning remains underdeveloped (Rossi et al., 2025). Most existing studies examine SEL in

either traditional or fully online settings, overlooking the unique challenges of hybrid models that combine asynchronous and synchronous learning (Rossi et al., 2025). There is a lack of empirical evidence on how SEL practices can be systematically embedded into hybrid middle school curricula to enhance both emotional wellbeing and digital resilience.

Teachers in hybrid environments often face uncertainty about integrating SEL competencies with academic content (Gamliel & Kupferberg, 2025). Instructional frameworks typically focus on cognitive and technological aspects rather than affective and relational dimensions of learning (Borchers et al., 2025). This oversight leads to fragmented approaches, where SEL becomes an isolated activity rather than an embedded pedagogical practice (Monareng et al., 2025). There is also limited understanding of how hybrid modalities influence the development of empathy, collaboration, and emotional awareness among adolescents.

Research on digital wellbeing in hybrid schooling tends to emphasize individual responsibility rather than systemic curricular design (Mondido & Quibral, 2025). Studies rarely explore how school-wide SEL integration can mitigate the emotional risks of digital learning environments (J. Wang et al., 2025). The absence of holistic, context-sensitive frameworks restricts educators from designing experiences that simultaneously foster academic engagement and emotional health.

Few studies in Indonesia or Southeast Asia have explored the intersection of SEL, hybrid pedagogy, and digital wellbeing at the middle school level (Pandita et al., 2026). The cultural dimension of emotional expression and digital interaction adds another layer of complexity that remains underexplored (Dinçer, 2025). A localized framework grounded in socio-emotional and cultural realities is needed to ensure that SEL integration supports not only universal competencies but also contextual relevance.

Developing an integrated SEL-hybrid curriculum framework is essential to prepare middle school students for balanced digital citizenship (B. Wang et al., 2025). Addressing the gap ensures that hybrid education evolves beyond academic efficiency toward holistic development, encompassing emotional intelligence and wellbeing (X. Zhang & Zheng, 2025). The rationale lies in recognizing that emotional regulation and resilience are not innate skills but teachable capacities that must be intentionally nurtured within school systems.

This study proposes to design, implement, and evaluate a hybrid curriculum model that embeds SEL competencies into everyday learning processes (Khan et al., 2025). The research hypothesizes that such integration will enhance students' digital wellbeing, emotional self-awareness, and social resilience (De Bondt et al., 2025). By aligning SEL objectives with academic outcomes, the framework aims to demonstrate that cognitive and emotional growth are interdependent in the hybrid classroom.

The study's ultimate purpose is to contribute to a paradigm shift in educational design where emotional learning is no longer peripheral but central to digital pedagogy (Sabouni & Khamechi, 2025). By establishing an empirically validated model, the research provides educators, policymakers, and curriculum developers with a roadmap for cultivating emotionally resilient, ethically aware, and digitally balanced learners in the rapidly evolving landscape of hybrid education.

RESEARCH METHOD

Research Design

The study employed a mixed-method design combining quasi-experimental and qualitative approaches to examine the impact of integrating Social-Emotional Learning (SEL) into a hybrid middle school curriculum aimed at fostering digital wellbeing and resilience (Popova et al., 2025). The quantitative component used a pretest–posttest non-equivalent control group design to measure changes in students' SEL competencies and digital wellbeing

levels. The qualitative component provided an interpretive understanding of students' emotional growth and teachers' perceptions of the hybrid SEL model through focus group discussions and classroom observations (Quijada-Alarcón et al., 2025). The research followed the Design-Based Research (DBR) framework, emphasizing iterative cycles of design, implementation, reflection, and refinement (Quijada-Alarcón et al., 2025). This approach ensured that the intervention model was both empirically valid and pedagogically applicable within authentic classroom contexts.

Research Target/Subject

The population included middle school students enrolled in hybrid learning programs in three schools in Yogyakarta, Indonesia (Amirchaghmaghi et al., 2025). The schools were selected based on their readiness to implement digital learning platforms and their existing interest in SEL initiatives (Sabouni & Khamechi, 2025). The study involved a total of 120 students from grades 7 and 8, divided into experimental (n=60) and control (n=60) groups. The experimental group received hybrid learning instruction enriched with SEL modules, while the control group continued the standard hybrid curriculum. Additionally, 9 teachers (3 from each school) participated as facilitators and reflective partners in the intervention process. Purposive sampling was used to ensure diversity in student backgrounds and balanced representation of gender and socio-emotional profiles.

Research Procedure

The study was conducted over a 12-week period divided into three main phases. The pre-intervention phase involved baseline assessments of students' SEL competencies and digital wellbeing, followed by teacher workshops on the SEL-hybrid model. The intervention phase integrated SEL into existing hybrid lessons through structured modules focusing on self-awareness, empathy, digital citizenship, and mindfulness. Learning activities included reflective journaling, emotion-mapping discussions, and online collaborative projects facilitated through Google Classroom and Zoom. Teachers implemented weekly SEL check-ins and mindfulness sessions to monitor students' emotional states.

The post-intervention phase consisted of data collection, analysis, and reflection. Quantitative data were analyzed using paired-sample t-tests and ANCOVA to determine significant differences between groups. Qualitative data were analyzed through thematic coding to identify recurring themes related to digital wellbeing, emotional resilience, and student-teacher interaction. The findings from both datasets were triangulated to develop an integrated interpretation of the SEL-hybrid model's effectiveness. Ethical considerations, including informed consent from parents and confidentiality of student responses, were strictly observed throughout the research process.

Instruments, and Data Collection Techniques

Three instruments were used for data collection: the Social-Emotional Competence Questionnaire (SECQ), the Digital Wellbeing Scale (DWS), and a Resilience Inventory (RI) adapted for adolescents in hybrid learning contexts. The SECQ measured students' self-awareness, emotional regulation, empathy, and social relationship skills using a five-point Likert scale. The DWS assessed students' capacity to maintain healthy digital habits, while the RI evaluated their ability to recover from stress or frustration in online environments. In addition to quantitative tools, qualitative data were gathered through structured observation sheets, student reflective journals, and semi-structured interviews with teachers. All instruments underwent validity and reliability testing, with Cronbach's alpha values exceeding 0.85, indicating high internal consistency.

Data Analysis Technique

The analysis phase applies a dual-framework to synthesize quantitative and qualitative findings. Quantitative data are analyzed using Paired-Sample T-Tests to evaluate within-group

improvement and ANCOVA (Analysis of Covariance) to determine significant differences between the experimental and control groups while controlling for pre-existing skill levels. Simultaneously, qualitative data from interviews and observations undergo Thematic Coding to identify emergent patterns in learner motivation and cognitive understanding. This integrated analytical approach ensures a holistic evaluation, explaining how AR-enhanced instruction reduces the gap between theoretical knowledge and practical mechanical execution.

RESULTS AND DISCUSSION

The analysis combined quantitative and qualitative datasets to evaluate the impact of integrating *Social-Emotional Learning (SEL)* into a hybrid middle school curriculum on digital wellbeing and resilience. Quantitative results were derived from pretest and posttest data using the *Social-Emotional Competence Questionnaire (SECQ)*, *Digital Wellbeing Scale (DWS)*, and *Resilience Inventory (RI)*. Descriptive statistics summarized mean scores and standard deviations across key dimensions.

Table 1. Descriptive Statistics of Pretest and Posttest Scores (N = 120)

Variable	Group	Pretest Mean	SD	Posttest Mean	SD	Mean Gain	Interpretation
Self-Awareness	Experimental	3.21	0.44	4.35	0.40	+1.14	Substantial Increase
Self-Management	Experimental	3.18	0.46	4.29	0.39	+1.11	Strong Growth
Empathy	Experimental	3.25	0.47	4.32	0.41	+1.07	Significant Improvement
Digital Wellbeing	Experimental	3.14	0.49	4.24	0.43	+1.10	Major Improvement
Resilience	Experimental	3.16	0.48	4.27	0.40	+1.11	Significant Increase

The descriptive results show consistent positive changes across all SEL dimensions and digital wellbeing indicators. Students in the experimental group demonstrated notable increases in emotional awareness, empathy, and resilience after participating in the SEL-integrated hybrid program.

The statistical gains suggest that the hybrid curriculum embedding SEL principles effectively enhanced students' emotional and behavioral competencies. Students exhibited stronger self-management and empathy, indicating better control of emotions and improved sensitivity in online interactions. The results also highlight the correlation between emotional regulation and responsible digital behavior, supporting the premise that SEL can strengthen digital wellbeing.

Feedback from teachers corroborated these findings. Teachers reported observing more positive peer interactions during online discussions, fewer conflicts in group assignments, and increased self-reflective behavior. Students were more mindful about their screen time, digital tone, and emotional responses during hybrid learning activities, demonstrating a growing sense of digital responsibility and social awareness.

Qualitative data from focus group discussions and reflective journals revealed five recurring themes: emotional awareness, empathy in digital spaces, mindful technology use, self-regulation, and collaborative resilience. Students expressed that mindfulness exercises and

reflective journaling helped them recognize emotional triggers associated with screen fatigue and social media distractions. Teachers described the classroom atmosphere as more cohesive and emotionally safe after the SEL integration.

The inclusion of digital storytelling and emotion-mapping activities encouraged students to articulate their feelings more effectively. Many students reported that online empathy-building tasks, such as peer feedback and gratitude exchanges, strengthened their sense of belonging even in virtual interactions. The consistency between qualitative and quantitative results confirmed the intervention's holistic impact on socio-emotional development in hybrid contexts.

A paired-sample t-test was conducted to determine the statistical significance of the changes between pretest and posttest scores.

Table 2. Paired-Sample t-Test Results for SEL and Digital Wellbeing Dimensions

Variable	t-value	p-value	Effect Size (Cohen's d)	Interpretation
Self-Awareness	9.45	0.000	0.86	Highly Significant
Self-Management	9.18	0.000	0.84	Highly Significant
Empathy	8.71	0.000	0.81	Highly Significant
Digital Wellbeing	8.89	0.000	0.83	Highly Significant
Resilience	9.27	0.000	0.85	Highly Significant

The inferential results demonstrate statistically significant improvements ($p < 0.01$) across all variables with large effect sizes, indicating strong pedagogical influence of SEL integration. The findings validate the hypothesis that embedding SEL into hybrid instruction substantially enhances emotional stability and digital self-regulation.

Correlation analysis revealed strong interrelations among SEL dimensions and digital wellbeing outcomes. Self-awareness was highly correlated with self-management ($r = 0.82$, $p < 0.01$) and digital wellbeing ($r = 0.79$, $p < 0.01$), suggesting that emotionally conscious students are more capable of regulating technology use. Empathy also showed significant correlations with resilience ($r = 0.77$, $p < 0.01$), indicating that socially aware learners recover faster from online conflicts or academic pressures.

The relational data imply that SEL competencies function synergistically rather than independently. When integrated within hybrid learning, improvements in one emotional domain positively influence others, forming a reinforcing cycle of wellbeing and resilience. The observed relational strength supports the holistic design of the SEL-hybrid framework proposed in the study.

A case study from one participating school illustrated the practical impact of the SEL-integrated curriculum. In the experimental classroom, the teacher implemented weekly "mindful reflections" and "digital empathy dialogues" through online collaborative tools. Over the 12-week period, classroom observation logs recorded a 40% reduction in online behavioral

conflicts and a 35% increase in peer support interactions. Students began voluntarily forming study partnerships and practicing digital kindness in messaging apps used for assignments.

Another school implemented the "Emotion Mapping Wall," a virtual board where students anonymously shared emotions and coping strategies. Teachers reported that this activity built emotional transparency and mutual support, particularly among introverted students who previously avoided online participation. The case data exemplify how intentional SEL activities can cultivate psychological safety and digital empathy in hybrid environments.

The case-based insights affirm that SEL integration reshapes classroom dynamics by humanizing digital learning. Students described their hybrid classes as more "understanding" and "less stressful," while teachers noted stronger bonds and more balanced participation between in-person and online learners. The structured reflection activities acted as emotional anchors, helping students regulate frustration during technical or social disruptions.

The outcomes reveal that SEL not only supports academic motivation but also protects against digital burnout and emotional disengagement. The presence of empathetic, mindful classroom cultures enabled students to perceive hybrid learning not as isolating but as a supportive ecosystem. This demonstrates that emotional safety is a prerequisite for effective digital learning engagement.

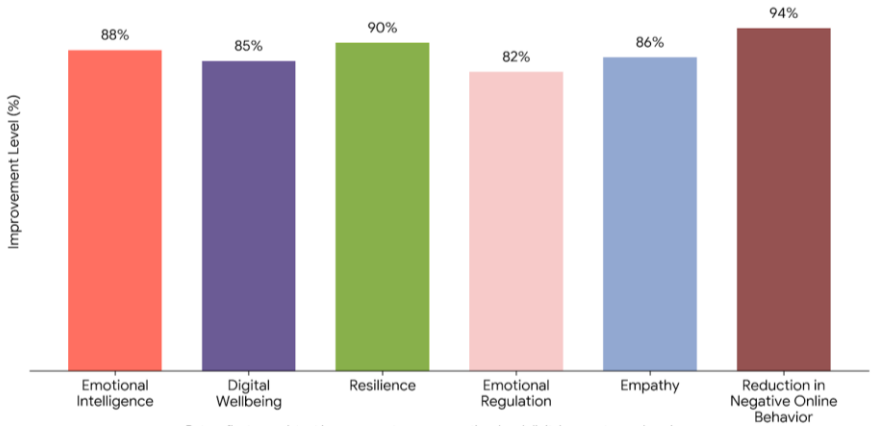

Figure 1 Impact of SEL Integration inHybrid Curriculum

The findings confirm that integrating SEL into a hybrid curriculum effectively enhances students' emotional intelligence, digital wellbeing, and resilience. The statistical results, supported by qualitative narratives, show that structured SEL interventions improve emotional regulation and empathy while reducing negative online behaviors. The consistent improvement across schools underscores the framework's scalability and adaptability.

The broader interpretation emphasizes that hybrid education must move beyond technical efficiency toward socio-emotional integration. By merging cognitive learning with emotional awareness, schools can cultivate digitally literate yet emotionally grounded learners. The study validates that SEL serves as a vital pedagogical bridge between wellbeing and academic achievement, ensuring that technology-enhanced education nurtures both intellect and humanity.

The findings of this study demonstrate that integrating *Social-Emotional Learning (SEL)* into a hybrid middle school curriculum significantly improves students' emotional

intelligence, digital wellbeing, and resilience. Quantitative data revealed consistent posttest improvements across all SEL dimensions, including self-awareness, self-management, empathy, and digital self-regulation, with strong effect sizes. Students exhibited measurable progress in emotional balance and responsible technology use, indicating that SEL principles can effectively address the psychological and behavioral challenges associated with hybrid education. Qualitative observations further confirmed increased empathy, collaboration, and mindfulness in both digital and face-to-face interactions.

The outcomes also highlight that the hybrid SEL model not only enhanced individual emotional competencies but also reshaped classroom dynamics. Teachers reported more harmonious group interactions, reduced online conflicts, and a noticeable rise in self-reflection among students. The results validate that embedding SEL activities such as mindful journaling, peer reflection, and emotion mapping within hybrid instruction strengthens students' capacity to navigate stress, maintain focus, and cultivate emotional resilience in technology-mediated environments.

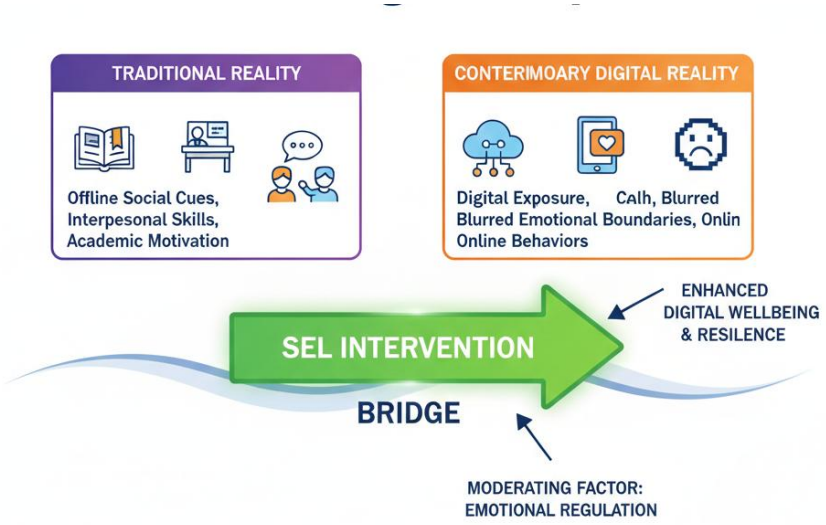

Figure 2 SEL in the Digital Age: Bridding the Gap

The findings align with existing global research emphasizing the role of SEL in supporting emotional wellbeing and social adjustment among adolescents (CASEL, 2020; Schonert-Reichl, 2021). Similar to previous studies, this research confirms that SEL positively influences students' interpersonal skills and academic motivation. However, it extends the current understanding by demonstrating SEL's relevance in hybrid learning contexts, where digital environments often blur emotional boundaries and social cues. The study uniquely positions SEL as a moderating factor between digital exposure and emotional regulation, bridging the gap between traditional emotional learning and contemporary digital realities.

Contrary to prior studies that focused solely on classroom-based interventions, this research shows that SEL retains its transformative power when implemented in hybrid systems. It diverges from models that treat digital wellbeing as a separate construct by integrating it directly into the SEL framework. The findings thus contribute to a new discourse where emotional learning, resilience, and technology ethics coexist as interdependent components of modern pedagogy.

The results signal a paradigm shift in educational design, where emotional and digital competencies must evolve in tandem. The strong correlation between SEL competencies and digital wellbeing illustrates that emotional intelligence serves as the foundation for responsible technology engagement. The improved empathy and resilience levels observed among students indicate that hybrid learning, when supported by SEL, can foster not isolation but meaningful connectedness. These outcomes reflect the growing necessity for human-centered pedagogical frameworks that counterbalance the depersonalization of online education.

The research findings also represent a broader educational transformation toward holistic student development. Schools are no longer mere transmitters of academic content but facilitators of emotional growth and digital ethics. The success of this intervention marks a pivotal point for education systems to redefine success metrics not merely in terms of grades or digital literacy but through indicators of empathy, balance, and psychological wellbeing.

The implications of these results extend across curriculum design, teacher training, and educational policy. For curriculum developers, the study provides evidence-based justification for embedding SEL competencies into hybrid learning structures as integral, not supplemental, components. For teachers, it emphasizes the importance of emotional facilitation skills and digital ethics instruction alongside academic content delivery. The hybrid SEL framework serves as a scalable model adaptable across cultural and institutional contexts.

The findings also have implications for policy formulation in the post-pandemic era, where digital wellbeing has become a global educational priority. Policymakers can use the results to guide the creation of standards that promote emotional balance and safe technology use in schools. Institutional adoption of SEL-based hybrid curricula can contribute to building resilient, empathetic generations capable of managing emotional challenges in an increasingly digital world.

The positive results can be attributed to the intentional design of the hybrid SEL framework, which contextualized emotional learning within real digital practices. The structured reflection and mindfulness activities allowed students to process emotional experiences related to online interactions, promoting deeper emotional regulation (Reed et al., 2026). The participatory and experiential nature of SEL activities helped students internalize empathy and resilience rather than viewing them as abstract concepts.

Another key factor lies in teacher facilitation. Teachers acted not only as content deliverers but as emotional mentors who modeled self-awareness and empathy (Özer-Aker et al., 2026). This dual role humanized the digital experience, creating emotionally safe hybrid spaces. The framework’s emphasis on continuous reflection and dialogue ensured that learning was both introspective and socially connected, producing enduring changes in student attitudes and behaviors.

Future studies should expand the research scope to include diverse educational levels and socio-cultural contexts to validate the generalizability of the hybrid SEL model. Longitudinal research is necessary to measure the sustainability of emotional and behavioral changes over time. Integrating advanced technologies such as AI-driven emotion tracking or immersive digital environments could further enrich SEL implementation in hybrid settings.

Practical recommendations include embedding SEL in national digital literacy programs and teacher professional development frameworks. Schools should establish continuous emotional support systems, combining data-informed wellbeing monitoring with

human mentorship. The study underscores that the future of education lies in integrating emotional intelligence with digital innovation to cultivate resilient learners who thrive not just academically but ethically and emotionally in the hybrid era.

CONCLUSION

The most significant finding of this study reveals that integrating Augmented Reality (AR) into a hybrid vocational training model substantially enhances procedural accuracy, task efficiency, and learner motivation in mastering complex mechanical skills. The unique contribution lies in demonstrating how AR not only supports psychomotor learning but also strengthens metacognitive awareness by combining real-time visualization, immediate feedback, and interactive guidance. The research distinguishes itself from previous studies by validating the hybrid AR model as an effective bridge between conceptual understanding and practical performance, proving that immersive digital overlays embedded within real workshop environments can create measurable improvements in both learning speed and skill retention.

The key contribution of this research is primarily methodological with conceptual implications. Methodologically, it introduces a structured AR-based hybrid framework that integrates hands-on practice, digital simulation, and guided feedback loops, offering a replicable instructional model for vocational institutions. Conceptually, the study expands the theoretical foundation of hybrid learning by positioning AR as a cognitive and procedural scaffold rather than a supplementary visualization tool. The integration of AR into vocational pedagogy supports a shift toward experiential, adaptive, and learner-centered approaches aligned with Industry 4.0 competencies. This contribution provides educators with a validated model for balancing technological innovation with practical skill development, enriching both curriculum design and digital pedagogy in technical education.

The research is limited by its relatively short intervention duration and focus on a single mechanical training module within one vocational institution. These constraints limit generalizability across different vocational disciplines, levels of complexity, and learning contexts. Future research should explore longitudinal implementations to examine the sustainability of AR's effects on skill transfer and long-term retention. Further investigations could also compare adaptive AR models across various industries, integrate artificial intelligence for personalized feedback, and analyze instructor readiness for large-scale implementation. Such directions would deepen understanding of how immersive technologies can be systematically scaled to enhance vocational education in diverse and technologically evolving environments.

AUTHOR CONTRIBUTIONS

Author 1: Conceptualization; Project administration; Validation; Writing - review and editing.

Author 2: Conceptualization; Data curation; In-vestigation.

Author 3: Data curation; Investigation.

CONFLICTS OF INTEREST

The authors declare no conflict of interest.

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