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The “Strawberry Generation” in the Teaching Factory: Multi-Perspective Qualitative Study of Soft Skills Assessment Dilemmas in Indonesian Vocational High Schools

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Abstract. Despite the fact that soft skills are considered essential for today's workforce, vocational schools often face difficulties when it comes to evaluating them as accurately as possible in real-world training environments. Additionally, empirical research on assessing such skills in authentic vocational contexts remains scarce. In order to gain in-depth understanding of this particular challenge, this exploratory case study investigates stakeholders' perceptions of soft skills assessment within the Teaching Factory (TeFa) at four vocational high schools in Yogyakarta, Indonesia. In-depth interviews were conducted with 13 key stakeholders, including policymakers, school administrators, vocational teachers, and industry partners. Thematic analysis revealed four themes. Firstly, TeFa operates as a high-stakes industrial simulation demanding strict workplace compliance. Secondly, there lies a striking disconnection between the rigorous soft skills required by industry and the frail mental resilience of current students, commonly referred to as "the Strawberry Generation". Thirdly, teachers suffer severe burnout and pedagogical dilemmas, juggling complex administrative workloads alongside shifting regulations. Lastly, these pressures expose a critical vacuum in authentic, real-time assessment. Findings highlight that current observational practices are highly subjective, poorly documented, and unsuccessful in measuring students' holistic development according to stakeholder perceptions. The current study concludes that traditional paper-based and memory-reliant assessment are no longer viable for dynamic TeFa environments, necessitating practical, technology-driven observation instruments to alleviate teacher burnout. Ultimately, these findings provide Indonesian policymakers to establish standardized, digitally supported assessment frameworks tailored for modern vocational education.

Keywords: digital assessment tools; soft skills assessment; strawberry generation; teaching factory; vocational high schools

1. Introduction

Due to rapid technological advancements and the integration of Industry 4.0 technologies, the demands for the global workforce have shifted dramatically in recent years. While technical proficiency remains a fundamental requirement, modern industries increasingly prioritize a robust set of soft skills such as adaptability, discipline, communicative competence and problem-solving skills, all of which are necessary when it comes to navigating through rapidly changing work environments (Poláková et al., 2023). For vocational education systems worldwide, this shift necessitates a departure from traditional, theory-heavy classrooms towards authentic, experiential and active learning models that reflect the actual pressures of the workplace. The transition towards these authentic models has been increasingly acknowledged as a cornerstone for improving the quality of education, ensuring equitable workforce readiness and fostering holistic student development (Mayombe, 2024).

In response to this global imperative, rapidly industrialized nations such as Indonesia have widely adopted the Teaching Factory (TeFa) model to accelerate workforce readiness. Contrary to conventional school workshops, TeFa functions as a genuine industrial ecosystem existing within school boundaries, which helps ensure systemic coherence across structural, institutional, and contextual domains (Wahjusaputri & Bunyamin, 2022). Within this ecosystem, students do not merely practice isolated skills; they handle real consumer orders, adhere to strict quality control standards and operate under authentic production deadlines to foster genuine professional accountability. This particular environment is intentionally created to help students reach technical mastery and experience the rigorous workplace culture, both of which hold significant importance when it comes to gaining long-term career success in multinational industries (Maware et al., 2023).

Existing literature extensively documents the theoretical benefits of workplace-based learning. Having students experience authentic production environments helps them gain technical competence faster and familiarize themselves with industrial workflows (Roll & Ifenthaler, 2021). Literature assumes that it is only when schools successfully replicate corporate ecosystems that graduates will demonstrate higher technical readiness, develop greater psychological resilience, and experience smoother transitions into the labor market (Jossberger et al., 2018). Furthermore, collaborative learning architecture demonstrates a much stronger potential for enduring educational transformation compared to episodic or decontextualized training models (Brennan & Gorman, 2023).

Despite everything, a troubling paradox regarding psychological readiness persistently remains. While today's youth grasp technical tasks quickly, a number of recent studies and industry supervisors have discovered a decline in their mental resilience under pressure in professional settings (Naseer et al., 2025). Within emerging socio-cultural frameworks, this demographic is often characterized as the "Strawberry Generation" – a metaphor depicting students who are visually polished and technologically adept, yet terribly fragile under pressure (Joosen, 2018).

This metaphor is intentionally highlighted in the title of this study because it perfectly encapsulates the core behavioral dilemma educators face today: bridging the gap between delicate student mentalities and rigorous industrial expectations. As they were put in high-stakes TeFa environments, these students are clearly frequently struggling to accept constructive criticism, adhere to strict industrial discipline, or persevere through complex tasks without continuous hand-holding (Dewi et al., 2026). This behavioral pattern supports broader educational findings indicating that a lack of active commitment and low intrinsic motivation directly fuel academic procrastination and task avoidance (Quispe-Bendezú et al., 2020).

Having to deal with this paradox places a significant pedagogical strain on teachers at vocational institutions. Required to simultaneously deliver curricula and manage industrial production, teachers at vocational institutions experience considerable stress and cognitive overload due to having to deal with such dual

responsibility (Kverneggen et al., 2026). Teachers frequently find themselves unprepared to adapt to these complex educational challenges without adequate support, highlighting a critical gap in pedagogical readiness. This administrative fatigue is exacerbated by a lack of clear institutional guidance. Yet, current literature predominantly focuses on the structural and economic aspects of TeFa, largely disregarding the day-to-day pedagogical dilemmas teachers face in shaping and evaluating character under the dual pressures of industrial demands and students' psychological fragility (Mouta et al., 2025).

Despite the widely acknowledged importance of soft skills and the evident psychological vulnerabilities of students in the current generation, a critical methodological void exists in how these competencies are authentically assessed. Within the dynamic, high-stakes environment of a Teaching Factory, teachers lack practical, validated tools required to measure real-time character development in a systematic manner (Abate et al., 2025; De Vries et al., 2024). Consequently, observational assessments remain predominantly unstructured, intuitive, and highly subjective. As highlighted by De Vos et al. (2024), this subjectivity often limits the depth of student evaluation and reinforces superficial compliance. Furthermore, existing models in the literature tend to emphasize final outcomes rather than the process-explicit mechanisms needed to track sustained behavioral changes and competence development over time (Alt et al., 2023).

Constrained by intense workloads and student-to-teacher ratios that frequently stretch pedagogical capacity, educators typically rely on delayed, memory-based evaluations (Adawiah, 2023). This reality causes the emergence of a systematic observation bias, where teachers primarily document extreme behavioral anomalies, such as highly disruptive or exceptionally proficient students. As a result, the subtle, incremental character progression of the average student largely goes unrecorded (Eckstein et al., 2026). As indicated by Yusop et al. (2023), traditional, paper-based rubrics and generic end-of-term tests simply fail to measure the nuanced, everyday realities of the workshop floor, further complicating the equitable evaluation of a student's true capabilities.

It is worth noting that the gap lies in the fact that what is currently known about TeFa assessment predominantly revolves around structural outcomes (Dong, 2020), whereas the manner in which soft skills are evaluated in real time amid the unique psychological dynamics of modern students remains largely unknown to most. Despite the growing body of literature on TeFa and soft skills, there has not been an empirical study that has specifically examined the assessment dilemmas faced by multiple stakeholders in the Indonesian context, particularly one focusing on the relationship between teacher burnout and the phenomenon of students who look polished and competent on the surface level but easily crack under pressure. The novelty of this research is on account of its holistic approach to uncover these day-to-day behavioral and administrative clashes, which in turn provides a robust empirical foundation that justifies the urgent need for practical, technology-driven observation instruments (Solberg et al., 2023).

Consequently, this exploratory case study aimed to investigate the experiences of a myriad stakeholders, including policymakers, administrators, vocational teachers and industry partners, to uncover the dilemmas that arise behind soft skills assessments in the TeFa ecosystem. More specifically, the research investigates how the authentic workplace demands of the Teaching Factory ecosystem define the soft skill requirements imposed on vocational high school students.

Furthermore, it explores how educators deal with the paradox between rigorous industrial standards and the perceived psychological fragility observable in students, who appear competent but crack immediately under pressure. Additionally, the study examines the pedagogical and administrative challenges that play a role in teacher burnout and root from assessing soft skills in high-stakes training environments. Finally, the current study analyzes specifically which current observational assessment methods prove unsuccessful, subsequently exploring how technology-driven tools play a role in addressing such a critical methodological void.

2. Literature Review

2.1 The Teaching Factory Ecosystem and the Nuance of Workplace Readiness

The TeFa model functions as an authentic learning ecosystem that aligns school-based workshops with industrial realities (Kangru et al., 2024). Still, understanding student development within this ecosystem requires a clear differentiation of foundational concepts. While employability skills represent the broad spectrum of competencies required to secure and maintain employment, workplace readiness specifically denotes a student's immediate preparedness to embark on an authentic working environment (Ramdas et al., 2025). Such workplace readiness may be attributed to the role of character as a fundamental moral compass, while discipline is associated with behavioral compliance with industrial standards.

Conversely, soft skills encompass specific interpersonal and intrapersonal capabilities, such as communicative competence and adaptability, whereas emotional resilience represents the specific capacity to recover from setbacks and persevere under pressure (Liu, 2026). TeFa is designed to cultivate all these distinct dimensions by enabling students to evolve from being passive receivers to becoming active participants in genuine productive operations, allowing them to possess a strong sense of professional identity in the process (Mann et al., 2021).

2.2 The "Strawberry Generation" Phenomenon: Perceptions of Emotional Resilience

As industries evolve, the integration of holistic soft skills has become a core dimension of vocational expertise. However, it is important to note that a psychological gap has emerged between students' high technical proficiency and their perceived emotional stamina. This demography is increasingly characterized by the socio-cultural idiom "the Strawberry Generation", a metaphor depicting youths who appear polished and capable on the surface level but easily crack under pressure (Joosen, 2018). Instead of casting judgment, sociological literature

attributes this phenomenon to protective parenting styles, intense digital exposure and a culture of instant gratification, all of which collectively limit students' exposure to organic afflictions (Masdonati et al., 2022).

Fundamentally, it must be noted that within the context of vocational training, the manifestation of such fragility is largely based on the observations and perceptions of educators and industry supervisors, as opposed to actual, clinical psychometric data. When required to adhere to strict industrial discipline or faced with constructive criticism within the TeFa environment, students evidently turn to task avoidance, which leads to higher anxiety and poorer performance. As resilience is a trainable competence, educators should intentionally create supportive environments to foster self-regulated learning.

2.3 Soft Skills Assessment in Vocational Education

The evaluation of non-cognitive traits requires robust methodologies. Thus, authentic and formative assessments are designed to evaluate students during real-world tasks, providing unceasing feedback to ensure continuous development (Pike et al., 2021). However, current literature uncovers a significant gap in workplace-based assessments. As highlighted by Gonçalves Cristóvão et al. (2024), measuring soft skills remains a highly complex task on account of the subjective nature of human behaviors. Whereas theoretical models support continuous formative feedback, practical implementations at vocational schools often rely on delayed, summative, memory-based observations (Suharno et al., 2020). This disconnection underscores the immediate need for digital assessment tools capable of measuring real-time, objective data on student behavior without disrupting ongoing learning activities.

2.4 Teacher Role Conflict and Burnout in Vocational Education

Dealing with student fragility alongside rigorous industrial requirements proves to be an immense burden on teachers. Within the TeFa ecosystem, educators are faced with a role conflict, as they are obligated to act as nurturing, pedagogical mentors to fragile students while doubling as strict production managers who conduct industrial quality control (Ceelen et al., 2023). Such dual responsibility consequently leads to cognitive overload and administrative fatigue, which lowers their capacity to conduct thorough soft skills assessments. When teachers experience burnout, evaluation paradigms revert to episodic, subjective rubrics that disregard any form of holistic development (Madigan & Kim, 2021). Therefore, addressing teacher burnout and modernizing assessment tools are closely interconnected, with each potentially influencing the other.

2.5 Theoretical Framework: Social Constructivism

The current study adopted social constructivism, positioning learning as an active, socially situated process. Within this framework, soft skills are acknowledged as practice-based capabilities cultivated through repeated interactions and shared cultural practices in the workshop, as opposed to fixed internal traits (Urkia-Basterra et al., 2025). This theoretical lens directly informs the research design: the interview questions were structured in such a way to explore how interactions between different stakeholders influence skill acquisition. The coding and theme development prioritized socially mediated

behaviours over individual psychological drawbacks, and the interpretation of the findings focused on the environmental and relational dynamics of the TeFa ecosystem.

Furthermore, social constructivism helps explain why current assessment practices may be unsuccessful in TeFa. Traditional paper-based rubrics tend to treat knowledge as a static product to be measured at the end of a semester. In contrast, a constructivist perspective suggests that socially mediated competencies require assessment tools that view evaluation as a continuous process of iterative feedback rather than as an isolated judgment (Carless, 2020; Waskito et al., 2024). This supports the current study's argument that real-time, process-oriented observation instruments can effectively capture authentic character construction as it occurs.

3. Methodology

3.1 Research Design

The current study employed an exploratory qualitative case study design to examine how stakeholders construct and negotiate soft skills assessment within the TeFa ecosystem. Focusing on TeFa as a bounded phenomenon enabled the research to accurately measure how pedagogical practices and assessment challenges are closely influenced by specific contextual industrial conditions (Yin, 2018). Whereas this case study design provides rich, in-depth qualitative insights, it is important to acknowledge that the findings are context-specific to the educational landscape of Yogyakarta, Indonesia, and are not intended to be statistically generalizable (Merriam & Tisdell, 2016).

3.2 Participants and Sampling Logic

A purposive maximum-variation sampling strategy was implemented in the recruitment of 13 key stakeholders deeply involved in the TeFa ecosystem. Such sampling technique is designed to uncover a wide range of perspectives associated with different stakeholder roles, ensuring a holistic understanding of the phenomenon from multiple angles (Patton, 2015). To ensure data richness, the participant recruitment processes were conducted by taking into account strict inclusion criteria: (1) active involvement in the TeFa ecosystem for a minimum of three years, and (2) experience in formulating, implementing, or receiving soft skills assessments. The final sample comprised 13 participants: one provincial educational policymaker representing a regional education agency, one industry partner, and 11 vocational teachers from four state vocational high schools (designated as Schools A, B, C, and D for confidentiality purposes) in the Special Region of Yogyakarta.

Essentially, the 11 participating teachers concurrently served as school administrators, including two Vice Principals of Curriculum, one Vice Principal of Facilities and Infrastructure, and eight Heads of Departments/Study Program Coordinators. As holding such dual roles intrinsically contributes to administrative fatigue, this specific sample was deliberately chosen. It enabled the research to explore how the structural burden of administrative duties aggravates

the pedagogical burnout of managing psychologically weak students. The details of the participants' demographic profiles are presented in Table 1.

Table 1: Participant demographics

Participant code	Stakeholder category	Professional position	Institutional category
P1	Policymaker	Head of Vocational Education Division	Provincial Education Agency
P2 – P3	Teacher & Administrator	Vocational Teacher / Vice Principal of Curriculum	State Vocational High School
P4	Teacher & Administrator	Vocational Teacher / Vice Principal of Facilities & Infrastructure	State Vocational High School
P5 – P12	Teacher & Administrator	Vocational Teacher / Head of Department	State Vocational High School
P13	Industry Partner	Industry Coordinator	Private Industry

3.3 Data Collection Procedures and Researcher Reflexivity

Following formal recruitment procedures by means of official institutional invitation letters, data were gathered primarily through semi-structured, audio-recorded interviews lasting approximately 45 to 60 minutes. Interviews were conducted between May and June 2025 in confidential environments chosen by the participants, such as private school offices or industry meeting rooms. All interviews were conducted in Indonesian to allow participants to express themselves naturally. Transcriptions of the interviews were subsequently translated into English for publication purposes.

In qualitative research, it is important to acknowledge researcher positionality. As a result, the researchers, possessing backgrounds in vocational education, maintained a reflexive journal throughout the data collection process to bracket personal preconceptions and ensure that interpretations remained grounded purely in the participants' narratives. The interview guidelines focused on the core research questions regarding soft skills evaluation. Data saturation was determined when continuous comparative analysis revealed that no new codes or themes emerged following the eleventh interview, with the final two interviews serving to confirm established patterns.

3.4 Data Analysis

The collected data were analyzed using a reflexive thematic analysis framework (Braun & Clarke, 2022). The analysis proceeded through iterative stages of familiarization, inductive open coding, category clustering, and overarching theme development. For instance, initial open codes such as “students easily giving up when corrected” and “frequent crying after minor mistakes” were clustered into the category of “low mental resilience”, which eventually evolved into the overarching theme of the “Strawberry Generation Paradox”.

Comparisons across the diverse stakeholder groups were then utilized to identify convergence, tensions, and recurring mechanisms within the narratives.

3.5 Trustworthiness and Ethical Considerations

Methodological rigour was established by strictly adhering to the fundamental criteria of qualitative trustworthiness (Lincoln et al., 1985). Credibility was ensured by means of data source triangulation – cross-verifying narratives among the policymaker, industry partners, and school-level educators – and member-checking, where participants verified the accuracy of the transcriptions. Transferability was achieved by providing rich descriptions of the educational contexts and sampling criteria. Dependability was ensured by keeping a meticulous audit trail of the coding process. Likewise, confirmability was ensured by means of the aforementioned researcher reflexivity and bracketing. Prior to data collection, all participants provided consent to participate in the study. The research protocol was formally reviewed and approved by the Ethics Committee at the Directorate of Research and Community Service, Universitas Negeri Yogyakarta (Approval No: T/567.2/UN34.9/PT.01.04/2025), strictly adhering to the WHO 2011 Standards and the 2016 CIOMS Guidelines.

4. Results and Findings

This section presents the empirical findings derived from the thematic analysis of 13 in-depth interviews with educational policymakers, school administrators, vocational teachers, and an industry partner. The findings presented below primarily reflect the observations and perceptions of the aforementioned adult stakeholders regarding student behaviours, as direct psychometric data from students were not collected. The analysis shed light on four dominant themes that measure the complexities of soft skills assessment within the TeFa ecosystem. To improve clarity, a summary of the themes and representative quotes, along with the frequency of their emergence across the participant groups, is presented in Table 2.

Table 2: Summary of key themes and participant frequencies

Theme	Core finding / sub-theme	Representative quote	Freq. (n = 13)
Theme 1: High-Stakes Industrial Simulation	TeFa demands strict workplace compliance, eliminating standard pedagogical leniency.	"Soft skills are the actual currency here." (P2)	13/13
Theme 2: "Strawberry Generation" Paradox	High technical proficiency clashes with stakeholders' perceptions of students' low emotional resilience.	"They bruise so easily, just like a strawberry." (P5)	11/13
Theme 3: Severe Teacher Burnout	Dual roles (mentor vs. supervisor) and loss of pedagogical authority create cognitive overload.	"I have to make sure ... client's order is perfect, and teach character values all at the same time." (P7)	12/13
Theme 4: Critical Vacuum in Assessment	Traditional rubrics are abandoned for memory-based grading due to extreme workloads.	"We only grade the anomalies." (P9)	13/13

4.1 Theme 1: The High-Stakes Nature of Teaching Factory as a Genuine Industrial Simulation

The first theme sheds light on the structural demands of the TeFa environment. Participants consistently emphasized that TeFa is not a traditional classroom but a rigorous simulation of real industrial workflows. The products manufactured by students are delivered to real consumers. This highlights the important fact that any misstep carries genuine financial consequences.

The transition from a safe learning space to a risk-laden production floor forces a shift in student identity, as articulated by the industry partner:

"When these students step into the TeFa workshop, they are no longer just teenagers learning a subject. They are operators on a production line. If they lack discipline... the entire production halts, and we lose client trust." (Participant 13, Industry Partner)

School administrators observed that while mastery of hard skills can be rapidly accelerated, the development of industrial character remains a protracted challenge:

"We can teach them how to operate a CNC machine in a week but teaching them to arrive on time... and handle production pressure takes months. Soft skills are the actual currency here." (Participant 2, Teacher & Administrator)

From a researcher's perspective, these narratives imply that the TeFa model fundamentally disrupts traditional vocational pedagogy. It shifts the educational paradigm from "competence acquisition" to "commercial accountability". Consequently, if an educational institution adopts TeFa solely to improve hard skills without taking into account how they enforce and assess behavioral discipline, the simulation will eventually collapse under industrial pressure.

4.2 Theme 2: The "Strawberry Generation" Metaphor and the Paradox of Industrial Expectations

Despite the clear demand for rigorous discipline, the second theme reveals a striking disconnection between industrial expectations and stakeholders' perceptions of students' psychological states. Educators and industry supervisors frequently used the metaphorical term "Strawberry Generation" – depicting youths who appear polished on the surface level but easily crack under pressure – to describe the phenomenon they observe on a daily basis. Participants characterized the students as technologically adept, yet exceedingly vulnerable to stress.

The contradiction between high technical proficiency and perceived low psychological resilience was distinctly encapsulated by the following statement:

"They are incredibly smart with their phones and digital tools. But the moment you raise your voice to correct a safety violation, they shut down. Some cry, others simply walk out of the workshop. They bruise so easily, just like a strawberry." (Participant 5, Vocational Teacher)

This perceived fragility frequently manifests in the form of avoidance behaviors. The industry partner expressed frustrations over a lack of problem-solving stamina:

"If a machine jams, they do not try to figure it out... There is a severe lack of grit and fighting spirit, which makes evaluating their work attitude incredibly frustrating." (Participant 13, Industry Partner)

However, it is worth noting that this perception was not entirely uniform. A minority of the participants (two teachers) noted that when students were given leadership roles in their peer groups, their resilience temporarily improved. Nevertheless, the prevailing consensus among the majority is that this profound gap places educators in an untenable position. The implication is that teachers are forced to constantly mediate between enforcing strict standards and managing emotional crises. Such a dynamic directly limits their capacity to conduct objective evaluations, as they are too busy extinguishing "emotional fires".

4.3 Theme 3: Pedagogical Dilemmas and Severe Teacher Burnout

The third theme captures the profound impact of the aforementioned contradiction on vocational educators. Teachers described a state of intense administrative fatigue. Within the TeFa ecosystem, they are obliged to take conflicting roles, as they must serve as supportive mentors while simultaneously acting as demanding industry supervisors.

This dual responsibility is exacerbated by large class sizes in high-risk settings. The cognitive toll was vividly captured in the following statement:

"I am exhausted. I have to make sure 36 students do not injure themselves, ensure the client's order is perfect, and somehow teach them character values all at the same time. It feels impossible to do all three."
(Participant 7, Vocational Teacher)

Furthermore, contemporary socio-cultural expectations result in pedagogical dilemmas, as teachers realize that their authority is restricted, as evidenced by the following statement:

"We are supposed to build industrial character, but if we are too firm, we face complaints from parents. We are walking on eggshells..."
(Participant 4, Teacher & Administrator)

Such responses indicate that the root cause of teacher burnout in TeFa is not merely physical exhaustion, but also a significant "role conflict". When systemic support is lacking and instructional authority appears to diminish, teachers may adopt a defensive pedagogical posture. Instead of authentically assessing and correcting soft skills, they are compelled to prioritize risk-avoidance to prevent parental backlash and workplace accidents. This, in turn, further compromises the integrity of character evaluation.

4.4 Theme 4: A Critical Vacuum in Authentic Soft Skills Assessment Methods

The culmination of industrial pressures, weak student mentalities, and severe teacher burnout leads directly to the fourth theme: a systemic failure in soft skills assessment methodologies. The findings reveal that authentic, real-time evaluation is virtually non-existent.

Educators acknowledged that observing the incremental character development of individual students is largely abandoned due to cognitive load, as summarised by the following statement:

"Honestly, the assessment rubrics just sit on my desk. I cannot hold a piece of paper and watch 36 students while operating heavy machinery. At the end of the month, I just fill out the grades based on whom I remember." (Participant 8, Vocational Teacher)

This reliance on memory-based grading procedures creates a pronounced systematic observation bias. Teachers default to recalling only behavioral outliers, as the following statement highlights:

"We only grade the anomalies. The incredibly bright student gets an A, the troublemaker gets a C, and the 30 other average students who are quietly trying their best just get a generic B. It is not fair, but it is all we can manage." (Participant 9, Vocational Teacher)

This dynamic empirically confirms a critical flaw in the current educational policy: the subtle, everyday progress that the majority of the students make goes entirely unrecorded. Acknowledging such methodological gap, policymakers voiced an urgent need for innovation, as encapsulated by the statement below:

"We need something fast and practical. If teachers had a simple application on their mobile phones to just tap and record a student's attitude... we could actually measure authentic data without adding to their administrative misery." (Participant 1, Policymaker)

The implication is profound: paper-based rubrics are practically incompatible with the dynamic reality of a factory floor. The consensus across diverse stakeholder groups firmly justifies the fact that transitioning toward practical, technology-driven assessment tools no longer remains an optional upgrade. Rather, it has become an absolute necessity, as the existence of such tools helps prevent the total collapse of character evaluation in modern vocational education.

5. Discussion

This study explores the multifaceted dilemmas that arise in the assessment of soft skills within the TeFa ecosystem, demonstrating how intense production demands can conflict with the perceived psychological fragility of vocational high school students. By examining these dynamics through the lens of social constructivism, this discussion contrasts the findings with previous studies, revealing the structural failures that become the root cause of teacher burnout and supporting the shift toward digital evaluation platforms.

5.1 The Reality of the Teaching Factory Versus Constructivist Ideals

While existing literature consistently supports the idea that simulative environments accelerate the mastery of technical competence and bridge the theory–practice gap (Chernikova et al., 2020; Jaffar et al., 2025), assuming that students can naturally acquire soft skills simply by being present in a workshop represents a critical misconception. Genuine work readiness requires a deliberate integration and a continuous reinforcement of discipline in social settings (Taryaningsih et al., 2026). Our findings contradict the idealistic assumptions made by earlier structural models and reveal a specific institutional problem: the daily operations of TeFa in Indonesia heavily prioritize final products and client satisfaction. This production-first orientation overshadows character building. As a result, it deprives mentally weak students of the pedagogical scaffolding required to convert workplace frictions into sustained emotional resilience (Jing et al., 2023).

5.2 The “Strawberry Generation” Paradox and Cultural Contexts

According to socio-constructivist principles, character development requires productive friction, which involves navigating criticism, overcoming failures, and resolving disagreements (Arega & Hunde, 2025). Unfortunately, vocational students of the current generation are frequently perceived as lacking the resilience to endure such friction. When students resort to avoidance behaviours, they bypass the very social interactions necessary to construct a professional identity (Capps & Becker, 2025). Whereas Western studies often attribute such avoidance to a lack of intrinsic motivation (Foust & Taber, 2023), the current study provides a contextual perspective from Indonesia, indicating that rapid digital fluency does not necessarily translate into emotional maturity in high-stakes physical environments. Technical expertise is rendered operationally useless if graduates lack the foundational soft skills to take action under pressure (Namjildorj, 2025).

5.3 Role Conflict and Pedagogical Deterioration

In a socio-constructivist environment, teachers take the role of facilitators who guide student reflections. However, managing large classes around heavy machinery while handling real consumer orders may force teachers to move away from this facilitative role (Boel et al., 2024). Educators experience a significant pedagogical role conflict: they are expected to support psychologically vulnerable students while simultaneously enforcing rigid industrial standards.

This finding firmly supports and expands upon recent literature regarding educator exhaustion (Creagh et al., 2025). Furthermore, the findings of this study imply that teacher burnout results from compounding alternative variables. Beyond the sheer pressure of production, the deterioration of pedagogical quality in TeFa is gravely exacerbated by the increasing student-to-teacher ratios, inadequate institutional psychological support for students, and the apparent lack of protective policies for teachers against parental complaints (Antony-Newman, 2024; Peng et al., 2026; Quin, 2017). Consequently, severe teacher burnout in these settings constitutes the structural failure of an educational system that demands industrial outputs without adequate pedagogical infrastructure.

5.4 The Critical Breakdown of Authentic Assessment

The most critical implication of the aforementioned pressures is the complete breakdown of authentic soft skills assessment. Socio-constructivist assessment demands continuous, formative feedback (Johansson et al., 2023). Conversely, the findings reveal that teachers show a strong reliance on delayed, memory-based grading because paper-based rubrics are rendered operationally unfeasible on an active workshop floor. The reliance on memory inevitably leads to extreme observation bias, leaving the subtle progress of the average majority undocumented (Giorgashvili et al., 2025). Such subjective grading fundamentally undermines the equity and validity of vocational education. The scarcity of accurate, real-time feedback deprives students of opportunities for self-reflection and behavioral correction, both of which are the cornerstones of constructivist learning (Arvatz et al., 2025).

5.5 Theoretical Contributions

The current study explicitly extends social constructivism within the context of vocational education. It demonstrates the idea that authentic workplace simulations—when implemented without explicit emotional scaffolding and supportive assessment frameworks—can, in fact, become less beneficial to pedagogical practices rather than proving constructive for vulnerable learners. The findings challenge the traditional theoretical assumption that immersion in a simulated industrial environment immediately fosters professional identity. On the contrary, they prove that unmediated industrial pressure triggers avoidance behaviours and dismantles formative evaluation processes.

5.6 Practical Implications and Recommendations

To address the aforementioned multifaceted dilemmas, the current study offers concrete recommendations for policymaking and practices. Firstly, in terms of curriculum development, vocational programs must explicitly provide emotional regulation and resilience training (emotional scaffolding) prior to placing students on the TeFa production floor. Secondly, teacher training should shift from merely upgrading technical skills towards developing competencies in conflict resolution and strategies for managing dual pedagogical-industrial roles.

Thirdly, and most urgently, there has become a critical need for the design and deployment of digital assessment instruments. As highlighted by recent advancements in educational technology (Adams & Crasborn, 2026; Kamaruzaman et al., 2025), the utilization of mobile-based assessment applications could potentially allow teachers to record behavioural data in real time. By digitalizing the observational procedures, schools will have the potential to mitigate teacher burnout and reduce memory bias.

However, because the current study did not empirically develop or test such an application, this remains a theoretical recommendation rather than a proven solution. It is also important to acknowledge that integrating digital tools into a factory environment introduces new operational challenges. Therefore, policymakers and administrators must carefully consider data privacy concerns and ensure robust infrastructural readiness. Furthermore, the use of mobile devices near heavy machinery poses significant occupational safety risks. Strict

operational protocols would therefore be required for such practices. Finally, although technology can streamline data collection, it cannot entirely eliminate inherent assessor subjectivity. Furthermore, digital tools should not inadvertently create an additional layer of digital administrative workload for teachers.

6. Conclusion

This study explored dilemmas that arise in the assessment of soft skills within TeFa in Indonesian vocational schools. While TeFa replicates industrial demands, stakeholders believe that it may expose the psychological fragility of students who appear competent but struggle to cope under pressure. When educators are required to deal with such fragility while simultaneously adhering to strict standards, they experience administrative fatigue. Fundamentally, such burnout is not solely caused by pedagogical challenges but is aggravated by the dual role administrative and instructional roles that teachers are required to fulfil. Consequently, production demands and competing responsibilities constrain the assessment process. Teachers are therefore compelled to rely on memory-based recall, resulting in subjective evaluations and leaving the development of many students undocumented.

Theoretically, this study extends the socio-constructivist paradigm by demonstrating that workplace simulations, when devoid of emotional scaffolding, can hinder rather than foster professional identity development. This methodological void deprives learners of the continuous, real-time feedback necessary to build genuine professional resilience.

Practically, traditional paper-based rubrics are operationally unfeasible on an active workshop floor. Stakeholders perceive a need for more practical assessment methods. Consequently, transitioning toward technology-driven observation instruments is not a sudden leap but a logical pedagogical necessity. Although technology cannot entirely eliminate inherent observation bias, mobile-based applications have considerable potential to mitigate subjective grading, streamline assessment workflows, and support more accurate character evaluation without disrupting production processes.

Therefore, this study explicitly recommends that the Ministry of Education and regional policymakers allocate targeted funding for the development and pilot testing of mobile-based soft skills assessment applications in vocational schools, together with comprehensive teacher training programs to support their implementation. Finally, these findings are contextually limited to the Special Region of Yogyakarta. Further empirical research across broader demographic contexts is required to validate these qualitative insights and formally test the proposed digital interventions.

7. Limitations and Future Research

This study acknowledges several methodological limitations. Firstly, the findings are derived from a small and geographically limited sample restricted to the Special Region of Yogyakarta, which limits their statistical generalizability. Secondly, there is an unequal distribution of participants across stakeholder

groups, as the study weighted toward vocational teachers and lacks direct student perspectives. Consequently, the data primarily reflect the perceptions of adult stakeholders rather than the students' own experiences. Thirdly, the reliance on self-reported interview data without corroborating classroom or workshop observations means the findings reflect subjective perceptions of behavior rather than objectively observed actions. Finally, the proposed digital assessment tool was not empirically tested, rendering it a theoretical recommendation rather than a proven solution.

To address these constraints, future research should employ mixed-methods or longitudinal designs to implement and quantitatively evaluate mobile-based soft skills assessment tools across diverse vocational settings. Additionally, incorporating direct observational methods and investigating targeted pedagogical interventions to foster emotional resilience among students who appear competent but struggle to cope under pressure, referred to as the "Strawberry Generation", would provide valuable directions for future inquiry. Ultimately, aligning rigorous industrial simulations with digitally supported assessment frameworks may contribute to ensuring that vocational graduates are not only technically proficient but also psychologically equipped for the demands of the modern workforce.

Conflict of Interest

The authors declare no conflict of interest.

8. Artificial Intelligence (AI) Usage Statement

The authors wish to acknowledge the use of Google Gemini in the writing of this paper. This tool was used to help improve the language and grammar in the paper. The paper remains an accurate representation of the authors' work and intellectual contributions. All intellectual content and final decisions remain the full responsibility of the authors.

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