

Exploring Problem-Solving and Critical Thinking Skills of TVET Students: An SME Employer Perspective

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Abstract

The objective of this study is to investigate the perspectives of small to medium enterprise (SME) employers on the problem-solving and critical thinking skills of Technical and Vocational Education and Training (TVET) students during their internships. Recognizing the importance of soft skills in today's labor market, the researchers aim to identify how practical experience, especially through internships, contributes to the development of problem-solving and critical thinking skills. Using a qualitative case study approach, semi-structured interviews were conducted with three SME employers in the multimedia sector, each with experience supervising TVET students during internships. The thematic analysis of the interview data showed that TVET students problem-solving and critical thinking skills can be developed during the internship programs. Students were able to adapt to the working environment and learn the skills through experience and hands-on practicals. Employers emphasized the need for a more structured approach to fostering these skills, suggesting that continuous exposure to real-world experiences combined with experiential learning in the classroom. However, students still rely heavily on supervision, lack self-confidence in making decisions, and lack creativity, indicating a gap in their preparedness for the workplace. Furthermore, the study highlights the importance of stronger collaboration between TVET institutions and industry. Employers stressed that TVET curricula should be more closely aligned with industry demands to better prepare students for the workforce. The findings suggest that a deeper partnership between educational institutions and industry is crucial to equipping students with the soft skills needed to meet the evolving demands of today's job market. This study contributes valuable insights for improving TVET programs and enhancing graduate employability.

Keywords: Critical Thinking, Internship, Problem-Solving, Soft Skills, Technical And Vocational Education And Training (TVET), Small To Medium Enterprise (SME).

Introduction

Soft skills are part of the competencies demanded by the labor market nowadays. While employees' technical skills proficiency is used for the job procedure, soft skills such as communication and problem-solving skills help smooth the workflow. Therefore, soft skills are crucial for a well-rounded education, aiding in personal growth, resilience, and success in academic and real-world settings (Kaushik & Sharma, 2023). In the context of problem-solving and critical thinking, several studies have highlighted soft skills emphasizing their role in enhancing employability and job performance. Problem-solving skills are not only about finding solutions but also about understanding the context and implications of those solutions in real-world scenarios (Nugraha et al., 2020), and critical thinking skills allow students to critically access the validity of information and arguments, thereby enhancing their problem-solving capabilities (Ashari et al., 2022). Thus, these skills are essential components for employability and future career development.

In the evolving job market nowadays, the demand for the workforce implicates all sectors including small and medium enterprise (SME) companies. SMEs comprise over 90 percent of business populations, represent a significant portion of the global economy, and are often characterized by their dynamic and flexible work environments (Bayraktar & Algan, 2019; Trzecieliński, 2016). SMEs can develop their human capital resources by benefiting from the Technical and Vocational Education and Training (TVET) model, increasing their productivity and improving the owners' time (Sundjoto, 2023). Practical training or internships in SMEs can enhance the employability of graduates and ensure that the workforce is adequately prepared to meet the demands of the economy, as SMEs play a significant role in every country (Widayati et al., 2023). Unlike larger organizations, SMEs may not have the resources to provide extensive training in soft skills, making it essential for new hires, including interns, to possess these competencies upon entry. Employers within SMEs, therefore, place a high value on candidates who demonstrate strong problem-solving and critical thinking abilities, as these skills directly contribute to the agility and competitiveness of the enterprise (Chithiraimaindan et al., 2023).

Nanda et al (2021), argue that a deficiency in soft skills can significantly impede graduate students' job prospects. In the case of TVET graduates, while their technical expertise is acknowledged, employers often identify a gap in their soft skill competencies (Akhir et al., 2021). Consequently, this perception may lead to unfavorable hiring outcomes, compounding TVET graduates' employment hurdles. As technical skills are prioritized in TVET systems, soft skills training is often neglected, hindering graduates' ability to innovate and solve problems effectively (Shahbazi & Ahmady, 2022). The disconnect between the skills taught in TVET programs and those required by employers can exacerbate the skills gap, leaving TVET graduates ill-prepared for the challenges they will face in their careers.

Therefore, internships serve as a critical bridge between formal education and the workforce demands. The working experiences gained through internships are statistically significant in enhancing graduate employability, as they help students develop the soft skills necessary to thrive in the job market (Basir et al., 2022). Internships enhance technical skills and significantly contribute to soft skills development, which is essential for career success. For TVET students, internships in SMEs offer a unique environment to develop and demonstrate soft skills, including problem-solving and critical thinking. Employers'

perspectives on students' performance during these internships can offer valuable insights into the effectiveness of TVET programs in preparing students for the workplace.

Furthermore, internships also benefit employers mutually. Employers can view the students who work in internship programs as talent-search for their future recruitment. The employers can assess the potential candidates in the real-working environment. Kosnik et al. (2013) emphasize that internships allow employers to screen potential employee candidates effectively, as students with learning project experience are often better prepared for the job market.

During internships, employers assess students in several ways. For TVET students, employers evaluate technical competencies, assessing how well they can apply the vocational and technical skills they learn, whether in engineering, construction, or information technology. Employers also assess the student's ability to adapt to the working environments, which are different from the educational environments. Employers value technical skills and other skills like collaboration and critical thinking, often developed through teamwork in educational settings (Pöysä-Tarhonen et al., 2016).

Furthermore, employers look for a strong work ethic and a willingness to learn, as these traits indicate a student's potential for growth and adaptability in their careers (Guan et al., 2017). Employers also value students with problem-solving skills, as they demonstrate the ability to tackle challenges and innovate solutions in real-time, which is essential in today's fast-paced work environments (Choudhar et al., 2022). This skill set not only prepares students for immediate job opportunities but also equips them with the tools necessary for lifelong learning and career advancement.

Therefore, employers' perspectives on students' performance during these internships can offer valuable insights into the effectiveness of TVET programs in preparing students for the workplace. Understanding these perspectives is crucial for identifying areas where TVET curricula can be improved to better align with industry needs. While much research has been conducted on the importance of soft skills in the workforce, there remains a lack of focused research on the specific perceptions of SME employers regarding the problem-solving and critical thinking abilities of TVET students during internships. Existing studies have generally approached the issue from a broad perspective, often neglecting the nuanced requirements and expectations of SMEs (Akolgo-Azupogo et al., 2021). As SMEs have roles in economic development and face challenges, it is essential to explore how these enterprises perceive the soft skills of TVET students and identify any gaps between employer expectations and student performance. This study addresses this gap by providing a preliminary case study of SME employers' perspectives on the problem-solving and critical thinking skills of TVET students during their internships.

The paper aims to explore soft skills competencies, particularly problem-solving and critical thinking skills, among the TVET students during their internship program. This study has two research questions: 1) How SME employers perceive the problem-solving and critical thinking skills of TVET students during internships, and 2) How employers perceive TVET institutions' role in developing students' problem-solving and critical thinking skills.

Focusing on problem-solving and critical thinking skills in TVET students in this study will enhance individual career success, strengthen SMEs, support economic development, and ensure that educational institutions are responsive to the labor market's needs. TVET institutions, which emphasize practical skills for specific industries, play a key role in equipping students with the capabilities that align with the expectations of SME employers. TVET students who possess these skills can differentiate themselves. By preparing students with skills that enable them to address complex problems and generate effective solutions, TVET programs support economic resilience and sustainability from peers and increase their appeal to employers, which is particularly valuable in competitive job markets. Moreover, this study is essential for TVET students to assist them with well-developed problem-solving skills that are more adaptable and open to continuous professional development, making them valuable in dynamic work environments. By addressing these competencies in TVET programs, educational institutions help bridge this gap, ensuring graduates have the skills employers need most.

Methodology

This study employs a qualitative case study approach to explore employers' perspectives in small to medium enterprise (SME) multimedia companies regarding the problem-solving and critical thinking skills of Technical and Vocational Education and Training (TVET) students during their internships. The case study method is particularly suited for this research as it allows an in-depth investigation into the experiences and perceptions of a specific group within a real-life context (Yin, 2018). A purposive sampling technique was employed to select participants for the study. This non-probability sampling method was chosen to select three employers of SMEs who are most likely to provide rich, relevant, and diverse insights into this study. The inclusion criteria for selection of the employers are that they have direct experience in supervising TVET students during their internships, from small to medium enterprise (SME) multimedia companies, and are involved in the evaluation and assessment of students' internship assessment.

Data collection was conducted through semi-structured interviews with the three selected employers. The semi-structured interviews enable interviewers to acquire in-depth information and evidence from interviewees while allowing flexibility and adaptability (Ruslin et al., 2022). The interview with Employer 1 and Employer 2 lasted more than 60 minutes, while for Employer 3, it lasted around 40 minutes. All the interview sessions were conducted conveniently, and consent was given for the interviews and the audio recording. Subsequently, the interviews were transcribed for analysis. The interviews were in Malay language, and only the quotes were translated into this study.

Thematic analysis was used to examine the interview data, allowing for the identification and interpretation of patterns related to employers' perceptions of TVET students during internships (Braun & Clarke, 2006). The process began with familiarization, where the researcher thoroughly reviewed interview transcripts, followed by systematic coding. Both inductive and deductive approaches were applied. Once codes were established, they were arranged into broader themes, with relationships between them examined to ensure the data was represented accurately. Member checking was used to verify the accuracy of findings by presenting a summary to participants, while reflexivity ensured that the researcher critically examined their biases throughout the process. Ethical considerations,

including participant anonymity and informed consent, were strictly followed. The small sample size limits the generalizability of the findings to other industries. Nonetheless, the study contributes valuable knowledge to understanding the role of practical experience in shaping employer expectations during internships.

Findings

Problem-Solving Skills and Critical Thinking Skills among TVET Students

Development of Critical Thinking and Problem-Solving Ability

All interviews emphasized the importance of practical experience in developing problem-solving skills among TVET (Technical and Vocational Education and Training) students. Employers asserted that these skills can only be honed through exposure to real-world situations that require immediate action and practical solutions. This allowed the students to sharpen their problem-solving ability and build their confidence. This aligns with the study by Chen and Gan (2021), which states that internships improve problem-solving skills and enhance employability. Data also revealed that the ability to adapt to new situations is a key component of critical thinking development. Employers found that students who could adapt and demonstrate resilience in challenging situations exhibited a higher level of critical thinking. For example, Employer 2 mentioned that students who could manage tasks independently, such as handling projects without direct guidance, showed critical thinking skills essential for their career progression. The development of critical thinking skills during internships, supported by the study of Nasir et al. (2018), underscores the necessity of developing cognitive skills, including critical thinking, as part of an internship preparedness program.

Employer 1: *"Saya rasa critical thinking ni susah nak ajar di kelas, tapi kalau kena terus dengan masalah, dia orang fikir sendiri."*

Translated: "I think critical thinking is hard to teach in the class, but if it happens with the problems, they will think themselves."

Employer 2: *"Aku campak dia dekat ground... fly sendiri, handle diri dia sendiri"*

Translated: "I send them on-site...fly by themselves, handle (the task) by themselves."

Employer 3: *"Problem solving ni bagi saya memang kena lalunya dulu baru kita akan jadi kreatif untuk memikirkan solusi dia"*

Translated: "For me, problem-solving needs to be experienced, then we will be creative in thinking of the solution."

Adaptation to the Workplace

Findings indicated that TVET students are capable of adapting to the workplace environment, particularly when they are given opportunities to solve problems directly. In the interview with Employer 1 session, the employer stated that although students often need time to adjust, they are able to solve problems effectively when given proper guidance. Similarly, Employer 3 highlighted that problem-solving skills develop when students are entrusted with the responsibility given a certain amount of time. Studies showed that internships play a significant role in adapting to the new workplace (Pan et al., 2018), aligning with the SME employer's expectations in this study.

Employer 1: *"Pelajar tak ada pengalaman, tapi lepas diberi peluang, dia orang boleh adapt"*

Translated: "Students do not have experiences, but after the opportunity given, they can adapt."

Employer 3: *"Dalam tiga bulan cukup kot untuk kita assess dia orang boleh lepaskan...memang saya boleh lepaskan"*

Translated: "In three months, it is enough for us to assess them, let them...I let them (working on their own)."

Learning through Experience

According to employers, critical thinking skills are honed through hands-on learning and self-reflection. For example, documenting standard operating procedures encourages students to carefully consider each step and action, sharpening their critical thinking abilities. In the context of internship, Sarkoohi et al. (2024) research indicates that nursing students participating in structured internship programs significantly improve their critical thinking dispositions.

Employer 1: *"Bila saya bagi tugas reka bentuk produk, mula-mula memang tak berapa baik, tapi lama-lama dia improve."*

Translated: "When I give them product design task, it is not good at first, but improved later."

Employer 3: *"Saya minta dia orang buat SOP dan mereka tulis SOP tu...mereka sendiri akan fikir cara yang terbaik."*

Translated: "I ask them to make the SOP...they think the best way themselves."

Limitations in Problem-Solving and Critical Thinking Skills

Despite progress in these skills, employers also identified certain shortcomings. Students often lacked the self-confidence to make simple decisions in the working environment, were over-dependent on the supervisor, and sometimes were less creative in the multimedia industries. Thus, working experiences are needed to address more complex problems, especially those requiring creative and innovative approaches. Goodenough et al. (2020), mention that internship students can improve and adapt to the workplace environments over time.

Employer 1: *"Kadang-kadang pelajar ni kurang keyakinan, dia takut nak buat keputusan sendiri."*

Translated: "Sometimes these students lack confidence; they are afraid of making their own decisions."

Employer 2: *"Budak-budak ni kadang-kadang tak berapa kreatif bila bagi tugas, dia ikut aje apa yang biasa dia buat"*

Translated: "These kids sometimes are not very creative when given task (to them), they only follow what they usually do (before)."

Employer 3: *"Mereka terlalu bergantung pada supervisor untuk check kerja, kena ada sikit lebih inisiatif"*

Translated: "They depend too much on their supervisor to check their work, (they) need more initiative."

The Relationship between TVET Institutions and Industry

Integrating Real-World Experience into the Curriculum

Educational institutions need to integrate more real-world experience into the TVET curriculum. Employer 1 emphasized that the TVET curriculum should be aligned with the industry and not emphasize only theories. Employer 2 emphasized that the creative industry requires educational institutions to integrate real-world working experiences into the TVET curriculum. This finding aligns with the study by Nkwanyane et al. (2020), which indicated that the curriculum needs revision to align with labor market demands.

Employer 1: *"Kurikulum kena aligned dengan apa yang industri nak, bukan sekadar teori"*

Translated: "Curriculum needs to be aligned with what industry demand, not just theoretical."

Employer 2: *"Institusi perlu tambah sikit real-world experience dalam kurikulum, kena banyak kerja dengan industri"*

Translated: (Educational) Institutions need to add real-world experience into the curriculum, and they need to work more with the industry."

Stronger Collaboration between TVET Institutions and Industry

Several employers stressed the need for a stronger partnership between educational institutions and industry to ensure that students are adequately prepared for industry challenges. This collaboration can ensure that students transition more smoothly from education to employment. A study in Malaysia highlighted that despite efforts to strengthen TVET, limited collaboration with industries has resulted in graduates lacking the necessary skills to meet job market demands (Amin et al., 2023).

Employer 1: *"Kita perlu lebih kolaborasi dengan institusi TVET... untuk pastikan pelajar sedia untuk industry"*

Translated: We need more collaboration with TVET institutions... to ensure students are ready for the industry."

Employer 3: *"Pelajar yang ada pendedahan awal dari institusi, yang tahu serba sedikit pasal industry, dia cepat adapt masa intern"*

Translated: "Students with early exposure from the institution, who know little about the industry, will adapt faster."

Discussion

This study highlights the importance of practical experience in developing the problem-solving and critical-thinking skills of TVET students. Employers emphasize that students can perform satisfactorily when given opportunities to work through real-world challenges. During the internship stages, students exhibit a degree of independence when solving the problem by thinking critically. However, students often require time and guidance to develop the confidence to make independent decisions fully. This shows that students can

learn through time and practical experiences and are resilient in learning during internships (Goodenough et al., 2020). This skills development nonetheless points out the integration of what is learned in educational institutions with how things are in the real world. As TVET education prioritizes technical and hard skills, soft skills also play roles in students' employability and career enhancement.

Moreover, the development of critical thinking among TVET students was evident when they were asked to handle tasks that required them to think beyond routine work, such as creating standard operating procedures or managing projects independently. Employers acknowledged that students who could adapt and reflect on their work exhibited stronger critical thinking skills, yet the need for structured guidance remained clear. Both problem-solving and critical-thinking skills were considered cognitive skills, suggesting that they can be developed with the participation of students during internships (Di Pietro, 2022).

While internships undeniably enhance these skills, they still lack specific soft skills. Most of the time, many students rely heavily on supervisors to provide direction, indicating a gap in their preparedness. This suggests that critical thinking, like problem-solving, must be fostered continuously through real-world exposure and classroom-based experiential learning. They also lacked self-confidence in making decisions and lacked creativity. Omar et al. (2023) agree that TVET students in Malaysia have only moderate employability skills and room for improvement. Therefore, training and ongoing experience are required to enhance students' ability to tackle more complex problems.

The relationship between TVET institutions and industry emerged as a crucial factor in determining how well students are prepared for their internships. Employers emphasized the need for educational programs to align more closely with industry demands, incorporating real-world experience directly into the curriculum. Collaboration between these two organizations is essential for bridging the gap between educational learning and the practical realities of the workplace (Joshi et al., 2022). Students who enter their internships with prior exposure to industry expectations tend to adapt more quickly, reducing their dependency on supervisors and increasing their ability to contribute meaningfully from the outset. Strengthening this partnership can ensure that students are better equipped with the necessary competencies to meet the evolving demands of today's industries.

Conclusion

In conclusion, this study aims to explore the current state of soft skills competencies, specifically problem-solving and critical thinking, among TVET students from the perspective of SME employers. The research indicates that practical experience is important for developing TVET students' problem-solving and critical-thinking skills. Though internships play a key role in enhancing these abilities, employers identified shortcomings in students' confidence, creativity, and independence that require attention. Moreover, deeper partnerships between TVET institutions and industry are essential to equipping students with the real-world competencies demanded by the changing job market.

Implication

The findings of this study are expected to have several important implications. For TVET institutions, understanding the perspectives of SME employers can guide curriculum

development to better integrate soft skills training, particularly in problem-solving and critical thinking. For employers, the study offers insights into the potential of TVET students as future employees and highlights the areas where additional training and support may be needed. Furthermore, the research contributes to the broader discourse on workforce development by emphasizing the importance of aligning educational outcomes with the dynamic needs of the SME sector. Future studies could explore and be conducted on soft skills development over extended periods and study the impact of structured partnerships between industry and TVET institutions influencing the educational curriculum.

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