Assessing TVET Teacher Competency: Students' Perceptions at ILP Pasir Gudang

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Abstract: Technical and Vocational Education and Training (TVET) teacher competency plays a vital role in Malaysia's education system, especially in the government's efforts to improve technical and vocational training. Developing competent and skilled TVET teachers is a key priority in Malaysia's TVET transformation efforts. While initiatives are in motion to improve teacher training and curriculum, concerns remain regarding skill gaps in TVET teacher competency. This study investigates students' perceptions of their teachers' competency at Institute Latihan Perindustrian (ILP) Pasir Gudang. The sample consisted of 621 students enrolled in the Sijil Kemahiran Malaysia (SKM) level 3 program. The findings revealed that students perceive TVET teachers at ILP Pasir Gudang as highly competent. However, teachers from the Electrical and Electronics Department received higher competency ratings compared to those in the Mechanical and Manufacturing Department. Additionally, first-semester students rated their teacher more favorably than those in later semesters. Lastly, Industrial Electronics students provided higher competency ratings for their teachers than General Machining students, who gave lower ratings. These findings highlight the need for targeted training programs and continuous professional development to ensure that all TVET teachers maintain high competency levels across different disciplines and departments.

***Keywords**: Competency, Technical and Vocational Education, Teacher skills, Teacher training and development*

1.0 INTRODUCTION

Technical and Vocational Education and Training (TVET) is vital to equip an individual with the relevant technical skills and knowledge to keep up with the requirements in the ever-changing world of work. In this industrial 4.0 era, TVET is important in preparing the manpower of the future based on innovation and sustainable technologies (Cedefop, 2021). At a time of rapid industrialization, TVET provides young people with the knowledge and skills needed to survive in the workplace. The importance of TVET goes beyond the question of employment to that of building the resilience of economies and societies, especially in developing countries, where vocational education can play an important role in turning unemployment into development (UNESCO-UNEVOC, 2020). Industry 4.0 steered the new work dynamics such as automation, artificial intelligence and green technologies (Ismail & Hassan, 2020). However, despite current initiatives to improve teacher training and curriculum, concerns over the quality of TVET teachers and skills mismatches. No curriculum can succeed without talented, flexible, and motivated teachers. TVET teachers are not only dispensers of information; they are also motivators and creators who seek to provide students with an opportunity to participate actively in work experience. However, keeping up with rapid changes in the industry is a significant challenge and highlights how critical it is for teachers to be good at what they do.

2.0 LITERATURE REVIEW

2.1 TVET Teacher Competency

Being a TVET teacher presents significant challenges. It is insufficient to merely acquire relevant skills and knowledge; one must also effectively instruct students who come from diverse backgrounds and possess varying learning needs. TVET teachers are required to undertake multiple roles, including those of teachers, vocational experts, digital citizens, and lifelong learners. The complex characteristics of the job demand an extensive skill set that includes the essential competencies, skills, knowledge, and attitudes that are needed in the digital age (Diao et al., 2024). In addition to technical expertise, teachers must exhibit teaching proficiency, digital literacy, and personal attributes such as empathy. According to Zhang & Liu (2022), TVET teachers should excel in three fundamental areas: an in-depth understanding of technical content pertinent to their field, effective teaching strategies that engage students, and socio-personal characteristics like communication skills and teamwork abilities necessary for preparing graduates to be valuable members of the contemporary workforce.

Recently, the emergence of digital technologies and Industry 4.0 has brought additional dimensions into competency requirements. In the present digital landscape, teachers must not only integrate technology such as virtual reality or data analytics into their classroom lessons but also maintain their own digital literacy while keeping flexible to new ideas of teaching and learning (Diao & Qu, 2024). Furthermore, TVET teachers must cultivate 21st-century skills such as critical thinking and problem-solving, which are crucial for students entering increasingly dynamic industry sectors (Sulaiman & Ismail, 2024). Continuous professional development for TVET teachers is vital since they must stay ahead of industry trends while managing their regular teaching responsibilities. Although this can be overwhelming, if managed effectively, it can transform lives for those receiving education and potentially drive economic growth in Malaysia.

2.2 Issues and Challenges in TVET Teacher Competency

The challenges faced by TVET teachers may impede their capacity to practice their professional skills. One of their problems is that they find it difficult to adjust and extend their skills in order to provide students with more insights and knowledge. In addition, the majority of TVET teachers have been trained primarily in academic settings rather than industry, and there is a notable disconnect between industry demands and teaching abilities. It is difficult for them to demonstrate the "latest and greatest" skills and techniques that are used by most industries today, partly because of their lack of industrial experience, which is not their fault (Halik Bassah, 2022). This disparity is particularly noticeable in

sectors that are evolving more quickly than training programs can keep up, such as sophisticated manufacturing and renewable energy.

Opportunities for TVET teachers to pursue professional development are another challenge. Many countries, including Malaysia, still lack these resources, which include inadequate educational infrastructure and training budget (UNESCO-UNEVOC, 2022) and high teaching loads, which hardly allow the TVET teachers to attend workshops or improve their skills. This problem is compounded when you consider the significance of digital capabilities, which are now a requirement across many sectors. The availability of such facilities is low in rural areas, or it is poorly implemented, which creates large disparities in terms of access to such online courses by teachers in rural areas (Diao & Qu, 2024).

Recognition and incentives are more conundrums. TVET teaching is sometimes seen as second best to mainstream academic education, coupled with an ambivalence about how useful they could be to society, which leads skilled technicians to avoid and leave teaching. Negative attitudes of teachers, negative self-perception, professional underachievement, low teacher motivation, limited career advancement and professional growth opportunities at the college level, and institutional alienation are also the causes behind teachers' despondency (Ismail & Hassan, 2020). Amplifying this challenge is the increased need for teachers to connect effectively with an ever-more diverse range of students, many of whom are disengaged, suffering from low levels of motivation, or facing significant social and economic disadvantage, thus putting significant pressure on TVET teachers.

Furthermore, the worldwide emphasis on sustainability has led to the need for TVET teachers to incorporate into their teaching green skills like eco-house construction and waste recycling. But a lack of training materials has made practical application difficult (Zainal et al., 2023). However, this shift requires not only new knowledge but also a change of mindset, and can be intimidating without adequate support and resources (Zhang & Liu, 2022). Relevant industries and institutions of learning for TVET should start by creating cross-border collaboration between industry and educational and training institutions to inform teachers about industry practices and in-demand skills. Governments and institutions must invest in enhancing TVET teacher professionalism, particularly in relation to digital literacy and green skills, and to make such opportunities available independent of geographical distance.

Given the changing TVET, promoting teacher competencies could not be more important. TVET is indeed a major vehicle for the future workforce, but that can only be drivers of the future workforce are TVET teachers. It would be better to prepare them to deal with these painful issues, so TVET can continue its role in transforming lives and economies well into the future.

3.0 METHODOLOGY

This study aimed to examine TVET teacher competency levels based on student perspectives across different groupings such as departments, semesters, and courses. Statistical Package for the Social Sciences (SPSS) software was used to analyze the findings. The population of this study is 655 semester 1 to semester 4 students' enrolment in various Sijil Kemahiran Malaysia (SKM) Level 3 programs in Institut Latihan Perindustrian (ILP) Pasir Gudang. This study employed a total population sampling technique, as all students within the defined population were targeted. With a response rate of 94.8%, a total of 621 students successfully participated in the study. The instrument used to collect data was a structured questionnaire, adapted from the student evaluation of the teacher's section in Sistem Pengurusan e-Penilaian Latihan (SPePL). This evaluation system was developed by the Planning & Research Division of Jabatan Tenaga Manusia to evaluate the effectiveness of training delivery and management across all institutions under Institusi Latihan Jabatan Tenaga Manusia (ILJTM).

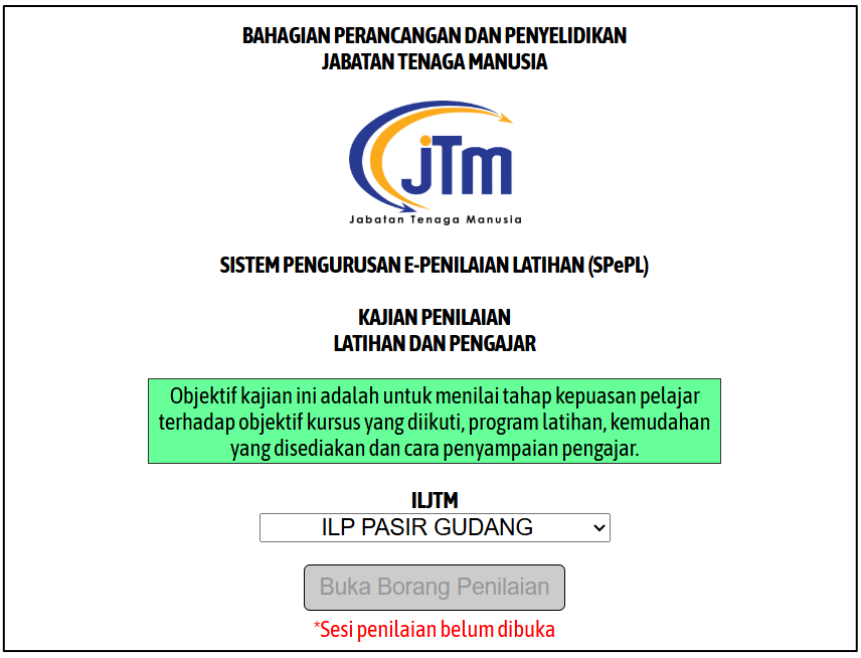

Image 3.1 Sistem Pengurusan e-Penilaian Latihan (SPePL) evaluation system interface

4.0 DATA ANALYSIS AND FINDINGS

The analysis for this study was conducted using descriptive statistics such as mean, standard deviation, minimum, and maximum (univariate analysis). The interpretation of mean scores follows Chua Yan Piaw's (2013) statement in Table 4.1.

Table 4.1 Interpretation of mean score (source: Chua, 2013)

Mean Score	Interpretation
1.00 – 2.00	Very Low
2.01 – 3.00	Low
3.01 – 4.00	Moderate
4.01 – 5.00	High

4.1 Teacher Competency Level by Department

Table 4.2 presents the analysis of TVET teacher competency levels based on department. There are two main departments in ILP Pasir Gudang. From the analysis, both departments recorded a high level of competency, with the Electrical and Electronic department having a slightly higher mean score (M=4.516) compared to the Mechanical and Manufacturing Department (M=4.435). This indicates that students from both departments perceive their teacher to be competent, with the Electrical and Electronic departments showing slightly stronger competency on average.

Table 4.2 Teacher Competency Level Based on Department.

Department	Min	Max	Mean	Standard Deviation	Interpretation
Electrical & Electronic	1.0	5.0	4.516	0.670	High
Mechanical and Manufacturing	1.0	5.0	4.435	0.665	High

4.2 Teacher Competency Level by Student's Courses

Table 4.3 presents the results of TVET teacher competency levels by course. Based on the analysis, students from all courses perceived that their teachers have a high level of competency, with Electronic Industry (4.707) and Electrical (4.664) being the highest. These results suggest that students in these courses may benefit from strong instructional support or have a greater interest in the subject matter. On the other hand, Machinist (4.198) and Industrial Product Design (4.187), while still in the high category, recorded the lowest means and highest standard deviations, indicating greater variation in students' perceptions of teacher competency in these courses.

Table 4.3 TVET Teacher level competency by courses

Course	Min	Max	Mean	Standard Deviation	Interpretation
Automotive	1.0	5.0	4.223	0.729	High
Metal Fabrication	2.0	5.0	4.454	0.603	High
Electronic	1.0	5.0	4.707	0.608	High
Instrumentation	1.0	5.0	4.452	0.642	High

Industrial Product Design	1.0	5.0	4.187	0.772	High
Electrical	1.0	5.0	4.664	0.539	High
Welding	3.0	5.0	4.626	0.567	High
Tool & Die	1.0	5.0	4.384	0.647	High
Mechanical Maintenance	1.0	5.0	4.568	0.569	High
Machinist	1.0	5.0	4.198	0.791	High

4.3 Teacher Competency Level by Student's Semester

Table 4.4 shows the descriptive statistics for TVET teacher level competency based on semester. All semesters reported that their teachers have high competency levels. Notably, Semester 1 recorded the highest mean score (M=4.536), suggesting a stronger teacher level of competency perceptions among the students in their early phase. Semester 3, while still high, had the lowest mean (M=4.361), possibly indicating academic or practical challenges during this period.

Table 4.4 TVET Teacher level competency by semester

Semester	Min	Max	Mean	Standard Deviation	Interpretation
1	1.0	5.0	4.536	0.630	High
2	1.0	5.0	4.503	0.735	High
3	1.0	5.0	4.361	0.656	High
4	3.0	5.0	4.478	0.646	High

5.0 DISCUSSION

The study's findings show that students at ILP Pasir Gudang regard their teachers as highly competent across departments, semesters, and courses. This is reflected in the consistently high mean scores based on Chua's (2013) interpretation scale. This perspective is consistent with other (TVET) research conducted both in Malaysia and other countries. Anwar and Mohamad (2022) discovered that TVET teachers in Malaysian vocational institutions have outstanding levels of skills, expertise, and motivation, despite slight problems in implementation in the classroom. These results also align closely with findings from Abdul Suki et al. (2018), whose Rasch-based evaluation of ILP instructors showed similarly high competency in technical, pedagogical, and social-humanity dimensions. This congruence reinforces the reliability of high competency perceptions among TVET instructors at industrial training institutions in Malaysia.

Research findings also revealed that students in both the Electrical & Electronic and Mechanical & Manufacturing departments rated their lecturers' competency as high. Although the difference between the departments is relatively small, the Electrical & Electronic department recorded a slightly higher mean. This suggests that students in this department may experience more effective

instruction, clearer communication, or more engagement in teaching practices. The relatively tight standard deviations indicate consistency in student perceptions across both departments, reinforcing the reliability of the results. This finding mirrors broader Malaysian findings, in which Ismail et al. (2020) confirmed that vocational teachers across public institutions exhibit strong technical competency covering machine handling, instructional planning, and practical strategies.

Furthermore, Sulaiman et al. (2019) pointed out the relevance of professional knowledge in improving the professionalism of technical teachers in Malaysian vocational colleges, stating that such knowledge has an impact on teaching efficacy. A higher competency level in the Electrical & Electronic department might reflect more effective technology-driven instruction and supportive learning environments in those programmes. Salleh et al. (2022) supported these by highlighting the significance of Technological Pedagogical Content Knowledge (TPACK) competencies among TVET teachers, emphasizing the role of mentoring and the school environment in fostering teacher skills.

Md. Hani et al. (2024) addressed the crucial need for TVET teachers to improve their digital competencies to meet the needs of Industry 4.0. Their study constructed a digital competency framework and found significant diversity in teacher readiness, which has an indirect impact on student competency acquisition in areas relevant to emerging technologies. Training institutions must also foster a learning environment that encourages lifelong and adaptable learning so that faculty may efficiently integrate new technology and techniques of learning into the classroom. It is strongly recommended that, as Industry 4.0 requires continuous professional development, TVET instruction becomes more responsive to technology and encourages lifelong learning by its practitioners.

Apart from technical skills, non-technical attributes such as adaptability, lifelong learning, and mental preparedness are vital for TVET teachers in the industry 4.0 era. High-rated competencies in this study suggest that lecturers at ILP Pasir Gudang are meeting these multifaceted demands. Similar findings from Nigeria (Sern et al., 2019) show a 19-element competency framework that underscores the global emphasis on teachers' broad competency beyond technical knowledge. Grosch (2017) interviewed on the process of developing competency standards for TVET teacher education in ASEAN countries, to regulate competency for teachers across the region.

When analyzed by semester, students perceived their lecturers as highly competent. Semester 1 students reported the highest mean score, which may reflect a greater sense of motivation and appreciation toward instructors during the early phase of their training. Although it remains within the high category, the lowest mean score was recorded in Semester 3. This slight decline may suggest that students in Semester 3 face increased academic or practical complexity, which could influence their expectations and assessments of teacher performance. Nonetheless, the overall consistency in mean scores across all semester points points to a stable and effective teaching standard throughout the academic progression. This also reflects effective in-service training combined with institutional systems like SPePL for ongoing performance feedback. Studies on professional development by Ithnain

(2022) show a strong correlation between active, focused CPD and improved teacher competencies. Integrating industrial experience into teacher education also allows continued professional development. Nanyang Polytechnic (2024) in Singapore has taken a "No Shelf Life" strategy, offering possibilities for continued professional growth and involvement in industrial projects. This strategy ensures that teachers are up to date on industry changes and that their teaching output remains relevant.

Even though teachers' competency has been highly valued, numerous challenges exist. A major concern here is a lack of industrial knowledge among TVET teachers, which may lead to practical relevance in their instruction. According to Abdul Rahman et al. (2019), many TVET teachers in Malaysia graduate from colleges without significant job experience, and there is still an urgent demand for structured industry affiliations. Furthermore, the rapid growth pace of Industry 4.0 necessitates that teacher-education institutions allow for continual updating of teaching abilities. Several initiatives have been made addressing the absence of industrial experience among TVET teachers as a major issue for practical skills training relevance in the 4th Industrial Revolution.

6.0 CONCLUSION

This study concludes that ILP Pasir Gudang students consider their teachers to be highly competent, qualified individuals, regardless of the departments, semesters, or courses they take. The consistently high average grades indicate that current teaching practices are being understood successfully and that institutional efforts to improve teacher competency in higher education are having a positive impact. However, the survey also identifies areas that need work. Courses with higher score variability and lower average grades require improvement. Addressing these gaps is essential to maintaining the quality of education across all programs.

7.0 RECOMMENDATIONS

In accordance with the findings, which are supported by both national and international research, TVET institutions such as ILP Pasir Gudang should prioritize ongoing professional development (CPD) for teachers through structured programs with an emphasis on pedagogical skills, technological integration, and industry-relevant knowledge. Strengthening collaboration with the industry to provide regular industrial attachments or hands-on experience for teachers will help to close the gap between academic training and real-world applications. Moreover, implementing standardized competency frameworks like TPACK and mentoring systems facilitates uniform quality of teaching across departments and courses. Institutions should also conduct regular performance reviews and utilize student feedback to help them improve their teaching approaches. Encouraging research, innovation, and reflective teaching techniques among teachers can help to improve instructional quality and assure alignment with

changing industry expectations, especially in the context of Industry 4.0 and beyond. By incorporating these recommendations, ILP Pasir Gudang and other similar institutions can improve the quality of TVET education and ensure that graduates are well-prepared to meet the demands of the changing workforce.

REFERENCES

Abdul Rahman, N L., Mokhtar, M., Ali, D. F., Winata, W. (2019). Issues and challenges faced by TVET teachers in vocational colleges, Proceedings of Educational Initiatives Research Colloquium 2019, 26-31, https://123dok.com/id/article/issues-challenges-faced-tvet-teachers-vocational-colleges.11805850

Abdul Suki, N., Yunus, F. A. N. ., Rahim, M. B. ., Masran, S. H. ., Marian, M. F. ., & Abd Baser, J. . (2018). Competency Of TVET Instructor Toward Technical Lesson in Institut Latihan Perindustrian (ILP). Online Journal for TVET Practitioners, 3(1). https://publisher.uthm.edu.my/ojs/index.php/oj-tp/article/view/4836

Anwar, F., & Mohamad, M. M. (2022). TVET Educators' Competency in Vocational Colleges: A Study on the Teaching Implementation Challenges. Research in Technical and Vocational Education and Training (RITVET), 2(1), 45–52. https://publisher.uthm.edu.my/periodicals/index.php/ritvet/article/view/7162

Cedefop. (2021). Digital transitions in vocational education and training. Cedefop Briefing Note. https://www.cedefop.europa.eu/en/publications/9163

Chua, Y. P. (2013). Asas statistik penyelidikan (Buku 1). McGraw-Hill Education (Malaysia).

Diao, J., & Qu, Y. (2024). Teaching competence of TVET teachers in the digital age: Implementation and evaluation of a training program in China. Evaluation and Program Planning, 103, 102405. https://doi.org/10.1016/j.evalprogplan.2024.102405

Diao, J., Han, X., Zhou, Q., Wang, Y. (2024). Professional Competencies in TVET: Framework, Indicators and Assessment Instrument. In: Han, X., Zhou, Q., Li, M., Wang, Y. (eds) Handbook of Technical and Vocational Teacher Professional Development in the Digital Age. SpringerBriefs in Education. Springer, Singapore. https://doi.org/10.1007/978-981-99-5937-2_3

Grosch, M. (2017). Competency standards for TVET teacher education in ASEAN countries. Jurnal Pendidikan Teknologi dan Kejuruan, 23(3), 218–226. https://journal.uny.ac.id/index.php/jptk/article/view/13418

Halik Bassah, N. A. S. (2022). The issues and challenges of TVET in Malaysia: From the perspective of industry experts. TVET@Asia, 18, 1-15. https://tvet-online.asia/issue/18/the-issues-and challenges-of-tvet-in-malaysia-perspective-of-industry-experts/

Ismail, A., & Hassan, R. (2020). Technical and vocational education and training (TVET) in Malaysia: Challenges and opportunities. Journal of Technical Education and Training, 12(3), 1-12. https://publisher.uthm.edu.my/ojs/index.php/JTET/article/view/6789

Ismail, K., Mohd Nopiah , Z. ., Mohamad, S. R., & Pang, C. L. (2020). Technical Competency Among Vocational Teachers in Malaysian Public Skills Training Institutions: Measurement Model Validation Using Pls-Sem. Journal of Technical Education and Training, 12(1). https://publisher.uthm.edu.my/ojs/index.php/JTET/article/view/4078

Ithnain, I. (2022). Effective Professional Development Model Increases the Competence of Vocational Teachers: Model Pembangunan Profesional Efektif Meningkatkan Kompetensi Guru Vokasional . Management Research Journal, 11(2), 52-63.https://doi.org/10.37134/mrj.vol11.2.5.2022

Md Hani, M. H., Ismail, A., Razali, S. S., Abu Bakar, M. N., Rosman. N. L., Nasir, N., & Mohamad, Z. (2024). The Development of Digital Competence Model Among TVET Educators Towards Digitization: A Concept Paper. Journal of TVET and Technology Review, 2(1), 1-18. https://publisher.uthm.edu.my/ojs/index.php/jttr/article/view/18112

Nanyang Polytechnic. (2024). Developing future-ready TVET educators: The "No Shelf Life" model in Singapore. In C. L. Lee & D. Y. Tan (Eds.), TVET and Technological Advancement in the Asia-Pacific (pp. 45–62). Springer. https://link.springer.com/chapter/10.1007/978-981-99-5937-2_4

Salleh, K. M., Ab. Rahman, N. S. N., & Ismail, S. (2022). TPACK competencies of Technical and Vocational Education and Training (TVET) teachers: Mentoring support and school environment. Journal of Technical Education and Training, 14(2), 91–102. https://publisher.uthm.edu.my/ojs/index.php/JTET/article/view/10528

Sern, L. C., Teh, E. Y., & Ho, S. Y. (2019). Developing a competency framework for TVET teachers in Nigeria. Journal of Technical Education and Training, 11(4), 59–70. https://publisher.uthm.edu.my/ojs/index.php/JTET/article/view/3250

Sulaiman, J. & Ismail S. N. (2024). Teacher competence and 21st century skills in Transformation Schools 2025 (TS25). Universal Journal of Educational Research, 8(8), 3536-3544. https://www.hrpub.org/journals/article_info.php?aid=10343

Sulaiman, N. L., Roslan, S., & Omar, N. (2019). Professional knowledge and professionalism among

technical teachers in Malaysian vocational colleges. Online Journal for TVET Practitioners, 4(1), 1–11. https://publisher.uthm.edu.my/ojs/index.php/oj-tp/article/view/5091

UNESCO-UNEVOC(2022). Trends mapping study: Digital skills development in TVET teacher training.https://unevoc.unesco.org/pub/trends_mapping_study_digital_skills_development_in_tvet_teacher_training.pdf

Zainal, N., Abdullah, A., & Yusof, R. (2023). Greening TVET in Malaysia: Teacher readiness for sustainable curricula. Sustainability, 15(6), 5123. https://doi.org/10.3390/su15065123

Zhang, J., & Liu, Y. (2022). Preparing TVET teachers for sustainable development in the information age: Development and application of the TVET teachers' teaching competency scale. Sustainability, 14(18), 11361. https://doi.org/10.3390/su141811361