Journal of Engineering Education Transformations ,
Volume 39, No. 1 , July 2025 , ISSN 2349-2473, eISSN 2394-1707

10.16920/jeet/2025/v39i1/25111

Work-Based Learning in TVET: A Perspective on Students' Experiences

Reyanhealme Rohanai[1], Hasyamuddin Othman[2], Muhammad Fazrulhelmi Ahmad[3], Siti Soleha Razali[4], Junita Sulaiman[5]

[1]Faculty of Technical and Vocational Education, Universiti Tun Hussein Onn Malaysia, Malaysia
[2]Faculty of Technical and Vocational Education, Universiti Tun Hussein Onn Malaysia, Malaysia
[3]Centre for Diploma Studies, Universiti Tun Hussein Onn Malaysia, Malaysia
[4]Faculty of Technical and Vocational Education, Universiti Tun Hussein Onn Malaysia, Malaysia
[5]Faculty of Technical and Vocational Education, Universiti Tun Hussein Onn Malaysia, Malaysia
[1]reyan@uthm.edu.my
[2]hasyam@uthm.edu.my
[3]mfazrul@uthm.edu.my
[4]ssoleharazali@gmail.com
[5]junesoo310@gmail.com

Abstract— Malaysia, in its pursuit of strengthening nation education, is actively reforming its Technical and Vocational Education and Training (TVET) system to align with diverse industry demands. However, challenges persist in empowering TVET especially providing comprehensive teaching strategy that match with industrial needs. This study in other view focuses on gathering students' perceptions towards their learning experiences within Work-Based Learning (WBL) programs, offering valuable insights into TVET program effectiveness and teaching strategies. A method of survey has been used in this study as to gather perceptions from the 62 respondents of technological students from selected TVET institution who had experience with WBL. Data has been analysed using mean score analysis and Pearson Correlation analysis to test the relationship between both perceptions of WBL effectiveness and teaching and learning experiences. The findings revealed moderate level of student perceptions on the WBL effectiveness towards self-development (M=3.33) and moderate perceptions towards their teaching and learning (TnL) experiences (M=2.99). Extensively, study revealed the positive correlation between WBL effectiveness and TnL experiences indicates that teaching strategy in WBL significantly influence the overall WBL effectiveness level or vice versa. Thus, this study suggests enhancements such as incorporating better teaching and learning strategy comprise of experiential projects, mentorship programs, interdisciplinary collaborations, and blended learning environments to enrich WBL programs effectiveness. Perhaps, this could provide a comprehensive perspective on students' views and offer guidance for enhancing WBL in Malaysian TVET institutions to create an impactful teaching and learning environment.

Keywords— Work-based learning, Technical and Vocational education and training, students' experiences

1. Introduction

Malaysia, in its role as a developing nation, is actively bolstering the Technical and Vocational Education and Training (TVET) system to align with the demands of diverse industries. Nonetheless, the country is still grappling with obstacles in establishing TVET as the primary educational choice. According to Noorazman et al. (2017), a multitude of concerns

Hasyamuddin Othman
Faculty of Technical and Vocational Education,
Universiti Tun Hussein Onn Malaysia, Malaysia
hasyam@uthm.edu.my

must be tackled within the realm of TVET to fulfill Vision 2020 and the Malaysian Education Development Plan 2013-2025. In 2012, the Ministry of Education acknowledged that Malaysia's TVET challenge extends beyond generating an ample number of skilled individuals. The focus also lies on realizing the nation's 2020 vision by equipping 1.6 million individuals with TVET qualifications for the workforce. Ramlee (2017) further points out issues tied to TVET, encompassing a negative perception, governance structure, framework enhancement, teaching staff competence, job alignment, industry integration, funding constraints, and modest salaries for TVET graduates.

In the context of education development, government has initiated specific guidelines that focuses in strengthening the TVET system through strategic initiatives. This initiative highlights the empowerment of TVET education quality through comprehensive teaching delivery and prosper support especially in facility development and areas for upskilling and reskilling program. The encouragement on the creation of formal teaching and learning guidelines are necessary so that educators can systematically apply these principles in lesson design and delivery (Razali et al., 2023). As to support this education development plan, current local TVET institution move forward to providing adequate industrial exposure by introducing a work-based learning (WBL) or apprenticeship program. This program brings a great role in facilitating students learning experience in the context of real industrial application and nurturing the dynamic classroom environment setting.

Work-based learning is a crucial aspect of TVET, as it provides students with real-world experiences and practical skills necessary for their future careers. According to the Malaysian Economic Planning Unit (EPU) in 2006, there is a recognized need for Malaysia to enhance the competencies of its workforce by augmenting the number of educated and skilled individuals. In light of this, Malaysia has initiated various training and retraining initiatives aimed at alleviating the issue of skills mismatch among graduates. In the pursuit of cultivating human capital, the emphasis lies on comprehensive growth encompassing both knowledge and skills, a forward-looking mindset, and a solid foundation in moral and ethical principles. Unfortunately, studies revealed that the delivery method of WBL for TVET students at the workplace is less effective and there were still obstacles related to the issue of WBL implementation and thus resulted to the negative impact on the effectiveness of WBL (Ugwoke et al., 2016; Haruna & Kamin, 2019).

Bringing an insight on the students' perceptions towards their experiences may open possibilities in tackling the current implementation and offering point of improvement that shall be considered for future improvement. Therefore, this study aims to identify technological students' perceptions towards learning experiences in WBL and examine further analysis on the WBL effectiveness and teaching strategy in work-based learning implementation across technological program. Perhaps in the future this study may provide sufficient information to promote strategic plans and reforms to be considered by the TVET practitioners for better WBL implementation.

A. Research Questions

a) What is the level of students' perceptions in WBL effectiveness and learning experiences?

b) Is there any significant relationship between students' perception in WBL effectiveness and learning experiences?

B. Research Hypothesis

H null: There is no statistically significant relationship between the perceptions of student towards WBL effectiveness and learning experiences.

H alternative: There is a statistically significant relationship between the perceptions of student towards WBL effectiveness and learning experiences.

C. Work-based Learning program in Malaysia

The implementation of WBL has become one of the learning approaches that impart students with the opportunity to feel the real experience of learning at work. The impact of WBL on skills enhancement encompasses communication, analytical skills, and exposure to authentic industrial work settings. In the context of higher education in Malaysia, WBL programs have garnered favorable attention from Higher Education Providers (HEPs) and are gradually being introduced into a variety of relevant academic programs. The reason is that WBL brings new style of learning environment and acknowledges the

workplace as a valid and essential context for learning. It helps to empower students by cultivating and refining their potential employability skills while offering them a diverse array of opportunities pertinent to career development. In essence, WBL aims to enhance student learning by forging closer partnerships with industries to shape program development and delivery. It seeks to enhance learning through experiential and service-based methods, fostering essential 21st-century skills. Additionally, WBL endeavors to leverage technology-driven approaches to personalize learning experiences, ultimately striving to cultivate well-rounded and skilled graduates.

As reported by Malaysian Qualification Agency in WBL Guidelines to Good Practices (GGP), there is no standardized approach of either WBL, or an integrated curriculum and it is often highly dependent upon the agreement between HEPs and industry partner. Therefore, the flexibility is given to HEPs and industry partner when designing a suitable curriculum to fulfil the objectives of WBL and meet learning outcomes for that specific course/ program. While WBL is acknowledged as effective, there were still shortcomings in its overall implementation. Current issues are related to the implementation of WBL which is seen to be less effective, especially in national TVET institutions practices. Previous studies revealed that the delivery method of WBL for TVET students at the workplace is still weak and less effective in achieving the learning objectives of students at the workplace (Ugwoke et al., 2016). In fact, there were still obstacles related to the issue of WBL implementation and thus resulted to the negative impact on the effectiveness of WBL in TVET training institutions (Haruna & Kamin, 2019). A recent study by Adan et al. (2021) at one of the Malaysia's TVET institutions also expressed the similar view where the existing implementation method still seen as less systematic and disorganized. Ideally, the implementation of this WBL should empower the quality of TVET students through active learning environment but unfortunately it is still seen as less effective due to the existence of task conflicts in the implementation of WBL between TVET institutions and national industry (Watisin et al., 2015) and weaknesses in the current implementation policy of WBL in the related industry (Amadi, 2013).

If this continues, this problem will affect the effectiveness of WBL implementation among students. As a result, students will not gather the real experience learning at the workplace and to learn work skills that should be mastered by students in the industry (Shukurov, 2020). Therefore, this study focuses on examining students' perceptions on the current implementation of WBL conducted by the technological students in Malaysian TVET Higher Institution. Through this initial study, it was expected that this study may gather an insight on students' perception in WBL besides provide crucial information for future initiatives in improving WBL delivery in Malaysia's TVET institution.

2. Methodology

A. Sample and population

The population of respondents to this quantitative method study consist of final year undergraduate students enrolled to technological courses in Malaysia's Technical University Network (MTUN). As MTUN is currently enhancing the delivery of technological programs through the implementation of Work-Based Learning (WBL), the primary objective in selecting respondents from technological courses is to closely examine the study's outcomes concerning the teaching and learning experiences of students in WBL.As this study involve case study on selected MTUN institution thus population of this study is taken from the selected groups of students that had experience in WBL session.

So, as to ensure that all students have chances to be as participant in this study, a random sampling technique was used in this study. The selection of the sample size for this study was influenced by a recommendation made in reference by Krejcie & Morgan (1970), which suggested that only 50% of the population be included in the sample. Consequently, the chosen sample size for this study is deemed sufficient for accurately representing the entire

Table I :
Respondent's Sample

TVET institution location	Technological Program	Number of samples
Johor, Malaysia	Building Construction	12
	Electrical & Electronic	28
	Mechanical & Manufacturing	22
	Total	62

population. Additionally, the study employed random sampling with the objective of examining three key characteristics among the respondents: gender, years of study, and technological students with WBL experience, specifically in relation to the effectiveness of teaching and learning. These elements were selected based on the data requirements of this research. The data collected from the sampled individuals in this study is presented in Table I below.

B.Research Instruments

Study was used questionnaire instruments from previous study and was modified to meet this research expectations. Questionnaire in this study used to collect information of respondents' background and items to measure the students' perception towards their learning experience in WBL session. In details, the questionnaire used five-point Likert scales and comprises three main items which are (i) students' background, (ii) students' perception in program effectiveness and (iii) students' perception in WBL teaching and learning experience. The data obtained were further analyzed using Statistical Package for the Social Sciences (SPSS) version 22.0.

C. Data Analysis

The first stage of data analysis entails evaluating the distribution of data to ensure the selection of suitable analytical methods, which can contribute to the effective presentation of results. Subsequently, the collected data is analyzed using the Statistical Package for Social Science (SPSS) software. Descriptive statistical techniques, such as mean, standard deviation, percentage, and frequency, were applied to gauge the perceptions of technological students regarding their experiences with WBL. The level of measurement in this study aligns with the guidelines provided in Table II, as recommended by Pallant (2007).

Table II :
Interpretation Of Mean Scores

Mean Score	Interpretation
3.34 – 5.00	High
1.67 – 3.33	Moderate
0.0 – 1.66	Low

The detail of mean calculation has been used in this study can be referred from equation below:

$$Mean = \frac{\sum xi}{n} \quad (1)$$

where,

Mean = Average score

$\sum xi$ = The sum of data value

n = number of summed data

Meanwhile, standard deviation calculation has been calculated from equation:

$$\sigma = \sqrt{\frac{\sum(xi-\mu)^2}{N}} \quad (2)$$

where,

σ = standard deviation

xi = particular data value

μ = population mean

N = population size

Furthermore, the data has been further analyzed to determine whether any relationships exist between students' perceptions of WBL effectiveness and teaching and learning strategies. Inferential statistical methods such as Pearson Correlation analysis has been used to measure significant differences among students' perceptions. It was assumed that there exists a significant relationship in this study, which was tested at a 90% confidence interval to validate this assumption.

3. Findings and Discussion

This section will provide a concise explanation of the findings and discussions arising from this study. As outlined in the study's objectives, this section will be structured into two primary components: first part covers the analysis on students' perceptions towards their experiences in WBL effectiveness and teaching and learning and second part covers the correlation analysis between effectiveness and teaching and learning experiences in WBL.

A. Respondents' Demographic Background

Based on the demographic background of the respondents in this study, several key findings can be observed. First and foremost, the study encompasses a

total of 62 students, revealing a significant gender imbalance within the sample. Specifically, a substantial majority of the respondents are male, accounting for 74% of the total, while female students represent a smaller proportion at 26%. This gender distribution underscores the prevailing trend in technological programs within case study projected on the selected TVET institutions, where male students are more dominantly represented.

Furthermore, the study includes students from a variety of technological programs, demonstrating diversity in program representation. Notably, the largest groups of respondents are enrolled in the "Electrical and Electronic Technology" programs, each constituting 45% of the sample. Additionally, the "Mechanical Technology" program is well-represented at 35%, followed by the students from the "Building Construction Technology" program which constitute the smallest segment of the sample, comprising 20%. This diverse program representation ensures that the study captures insights from a range of technological disciplines, facilitating a comprehensive assessment of student perceptions regarding WBL experiences and teaching strategies across different fields of study.

Table III :
Data On Respondent's Demographic Background

Categories	Item	Percentage (%)
Gender	Male	74%
	Female	26%
Program	Building Construction Technology	20%
	Electrical & Electronic Technology	45%
	Mechanical Technology	35%

B. Student's overall perceptions towards WBL effectiveness

Based on the result, the average value of all the items combined was at mean of 3.33 and standard deviation of 1.03, which falls into the medium score level. This indicates that, on average, the respondents had a medium level of perception in the impact of WBL on various aspects, such as communication and analytical skills, respectful interactions, and exposure to real industrial working situations. The highest mean score value is the fourth item (Mean = 3.74; SD = 0.97) in which students highly claimed that this WBL session had exposed them to the real industrial working situation. In contrary, the lowest score is the first item (Mean = 2.87; SD = 0.97) in which students moderately claimed that WBL taught them to solve problem and make decision effectively. Based on these findings, it can be inferred that the WBL program has generally been successful in delivering positive outcomes but could benefit from some fine-tuning and enhancements to maximize its effectiveness

Earlier study by (Boud & Solomon (2001) has stated the strength of WBL is in developing student's skills. The study claimed that WBL has been recognized as a valuable method for developing problem-solving and decision-making skills in students and trainees. By exposing learners to real-world challenges and scenarios, WBL allows them to apply their theoretical knowledge to practical situations. Research has shown that WBL can enhance problem-solving abilities and improve decision-making processes by fostering critical thinking and analytical skills. WBL also provides positive contribution of work-based learning to the development of the transferable skills of those involved in the program especially in communication skills and identifying critical issues (Falconer, 2003).

Table IV :
Data on Student's Overall Perceptions Towards Wbl Effectiveness

No.	Items	Scores	Standard Deviation	Interpretation
1	WBL taught me to solve problem and make decision effectively.	2.87	0.97	Moderate
2	WBL taught me about effective communication skills (including speaking and writing).	3.26	0.97	Moderate
3	WBL taught me about analytical skills as needed by the industry.	3.37	0.94	High
4	WBL taught me to work respectfully with other workers from different races.	3.74	0.97	High
5	I am happy to take part in this WBL session.	3.00	1.2	Moderate
6	This WBL session had exposed me to the real industrial working situation.	3.76	1.1	High
	Average value	3.33	1.03	Moderate

Furthermore, effective communication skills are crucial for success in the workplace. Current studies also highlighted the positive impact of WBL on student's communication and acknowledge that students have been exposed with real work environment during their WBL and this has made them became more competent in both technical and non-technical skills (Mat Tuselim et. al., 2020).

Upon above discussion, it shows that WBL clearly has a positive impact on various aspects of participants' learning experiences. In summary, this study claimed that respondents reported a positive agreement regarding the development of their effective communication skills, analytical skills, and the ability to work respectfully with individuals from diverse racial backgrounds. The exposure to real industrial working situations was also highly acknowledged by the respondents. However, there were areas such as problem-solving and decision-making skills and overall satisfaction with the WBL session that showed room for improvement. It is also suggested that enhancing the methods of teaching delivery is another significant aspect that appears to have the potential to enhance students' satisfaction during their WBL sessions.

C. Student's overall perceptions towards WBL teaching and learning experiences.

Based on the result, the average value of all the items combined is at 2.99, which falls into the medium score. This indicates that, on average, the respondents had a medium level of perception in their WBL teaching and learning experiences on various aspects of learning materials preparation, suitability in class delivery and assessment workload. The highest mean score value is the second item (Mean = 3.35; SD = 1.07) in which students highly claimed that "Lecturer delivers class with suitable learning media". In contrary, the lowest score is the first item (Mean = 2.18; SD = 1.06) in which students moderately claimed that "lecturer uses all the learning materials that has been prepared wisely". Similarly, students perceived that they have experienced a moderate agreement on the sixth item "Projects and assignments given were easy for me" (Mean = 2.85; SD = 1.07) and fifth item (Mean = 3.03; SD = 1.17) which "Lecturers demonstrates teaching strategy that is suitable to my learning situation in WBL". These moderately positive perceptions expressed by the students suggest that there is room for further improvement in the teaching and learning experience, with the potential to enhance the overall learning environment in WBL.

In overall, the findings show that students generally have a moderate level of satisfaction with the WBL teaching and learning experiences. While the lecturer's use of learning materials, suitable learning media, and teaching activities are perceived positively, there's room for improvement in delivering clear instructions, aligning teaching strategies with the WBL context, and creating more challenging projects and assignments. These findings provide valuable insights for the institution and the lecturer to consider adjustments in order to enhance the overall quality of the WBL program. The moderate ratings overall suggest that the teaching methods are generally effective, but there's an opportunity to enhance clarity, alignment with WBL principles, challenge level, and variety in teaching strategies and materials to create a more robust and engaging learning environment. Consistently, previous study by Wall (2017) acknowledged that various approaches in WBL learning to inculcate knowledge especially in climate literacy beyond the higher education setting are still unknown and shall be discussed further. Thus, this situation embarks to the needs in strengthening the suitable learning approaches to be implemented in WBL session according to the knowledge of study.

Ideally, WBL equips students with the skills to work independently and learn how to practically execute tasks. However, this sometimes results in a conflict of guidance from instructors. A recent study conducted by Pylväs in 2022, which focused on Vocational Students' Perceptions of Self-Regulated Learning in Work-Based Vocational Education and Training (VET), highlighted that student expressed concerns about insufficient guidance, poor communication, and challenging work schedules. Furthermore, students contended that their challenges in performance were influenced by environmental factors, including a lack of social support, unclear communication, inadequate information, and demanding work schedules. For instance, the demanding work environment and long hours of apprenticeship training, combined with academic studies, were perceived to necessitate initiative and, in some cases, lead to stress among participants.

In summary, result of this study on students learning experiences provided reveal several notable strengths, including the proficient utilization of learning resources and multimedia technologies.

Table V :
Data On Student's Overall Perception Towards Wbl Teaching And Learning Experiences

No.	Items	Scores	Standard Deviation	Interpretation
1	Lecturer uses all the learning materials that has been prepared wisely.	2.18	1.06	Moderate
2	Lecturer delivers class with suitable learning media.	3.35	1.07	High
3	Lecturer applies several suitable teaching activities.	3.16	1.18	Moderate
4	Lecturer delivers clear instructions and information during class session.	3.34	1.12	High
5	Lecturers demonstrates teaching strategy that is suitable to my learning situation in WBL.	3.03	1.17	Moderate
6	Projects and assignments given were easy for me.	2.85	1.07	Moderate
	Average value	2.99	1.11	Moderate

However, they also draw attention to some areas that may benefit from enhancement, namely in relation to the clarity of instructions, adherence to principles of WBL, suitable teaching strategy and the degree of difficulty presented by assignments. The results have the potential to provide valuable guidance for the institution and the lecturer in making specific modifications that might augment the overall efficacy of the WBL program. Perhaps, these attentions may result in heightened levels of student satisfaction in learning experiences and enhanced learning outcomes.

D. The Correlation of WBL Effectiveness and Teaching Strategy in Work-Based Learning Implementation Across Program

This section explains the correlation analysis between WBL effectiveness and teaching strategy in WBL implementation across program. Extensively, the correlation coefficient, ranging from -1 (perfect negative) to 1 (perfect positive), measures the strength and direction of the linear relationship between two variables. As being reported by Salkind (2003), the correlations coefficient of 0.8 to 1.0 indicates a very strong relationship, 0.4 to 0.59 indicate a medium relationship while 0.0 to 0.19 indicates very weak relationship. Based on the study findings, it shows that the correlation coefficient score is 0.440 (positively correlated) and significant at 0.01 level as shown in table below. Thus, null hypothesis is rejected where there is a statistically significant relationship between the perceptions of student towards WBL effectiveness and learning experiences. This finding implies that the correlation does exist in the population and thus null hypothesis is rejected. It was found that there is a significant moderate positive correlation recorded between WBL Teaching Strategy and WBL Effectiveness in the context of WBL program implementation. The correlation data can be referred as Table 6 below.

Table VI :
Correlation Analysis Data of Student's Perceptions In Wbl

Correlations			
		WBL Effectiveness	WBL teaching strategy
WBL Effectiveness	Pearson Correlation	1	.440**
	Sig. (2-tailed)		.000
	N	62	62
WBL teaching strategy	Pearson Correlation	.440**	1
	Sig. (2-tailed)	.000	
	N	62	62

**. Correlation is significant at the 0.01 level (2-tailed).

This positive correlation signifies that as one variable, either WBL Teaching Strategy and WBL Effectiveness, increases, the other variable tends to increase as well. However, it's important to note that the correlation is not very strong, suggesting that other factors not considered in this analysis may also influence WBL program outcomes. This means that when one of these variables improves, the other tends to improve as well. In practical terms, it implies that programs implementing more effective teaching strategies for work-based learning are more likely to achieve better overall effectiveness in their WBL programs, and vice versa.

Correlation does not imply causation, and it's vital to acknowledge the complexity of factors influencing educational outcomes. While a positive correlation suggests a relationship between teaching strategies and program effectiveness, other variables like

student characteristics, institutional support, and curriculum design can also significantly impact WBL effectiveness. To establish causation and understand causal pathways, longitudinal studies, experimental designs, or qualitative research exploring the experiences of students and educators may be necessary (Bryman, 2016). Additional research and analysis are necessary to uncover the underlying factors and dynamics that drive the relationship between the effectiveness of work-based learning and the strategies used for teaching in these programs.

After all, this study proved statistically that teaching strategy had a positive relationship to the WBL effectiveness and thus indicates that teaching strategy in WBL may affects the overall WBL effectiveness or vice versa as accordance to the student's perceptions.

Conclusion

The findings of this study shed light on the overall positive perceptions of technological students towards their learning experiences in WBL within Malaysian TVET institutions. Notably, students rated their experiences as high in terms of analytical skills, social interactions, and exposure to real industrial working situations. This underscores the value of WBL in equipping students with essential skills related to workplaces. However, there is room for improvement, particularly in the areas of overall satisfaction in WBL effectiveness to the students such as decision-making skills and communication skills development, overall satisfaction with the WBL learning environment especially in terms of instructions clarity, alignment of teaching strategies with WBL principles, and the workload of assignment. This study also highlights the significant findings on the relationship between WBL effectiveness and teaching and learning experiences. Notably, students perceived that teaching and learning experiences does influence their satisfaction in WBL effectiveness and it is correlated to each other. This indicates that the level of satisfaction in teaching and learning environment perceived by the students do have the impact on the effectiveness of WBL applied to the students. This led us to the needs in strengthening the teaching and learning strategy as to sustain the WBL effectiveness among students in the future.

In order to optimize the WBL effectiveness, it is important to enhance problem-solving and decision-making abilities among students via the integration of practical exercises and real-world decision scenarios into the WBL curriculum. These activities may include case studies, simulations, or collaborative projects that push students to use their theoretical knowledge in real-world contexts. Furthermore, enhancing the comprehensibility of instructions during WBL sessions is of utmost importance. Effective learning and task execution may be facilitated by implementing extensive briefings, providing written instructions, and offering opportunity for students to seek clarification as necessary. Furthermore, it is important to closely match instructional methodologies with WBL concepts. Promoting the adoption of pedagogical techniques that emulate authentic workplace interactions and prioritise appropriate experiential learning strategy has the potential to enhance the working experience among students (Mayombe, 2023). In conclusion, it is crucial to assess the difficulty level of assignments and projects, ensuring a harmonious blend of attainable tasks and those that encourage students to broaden their horizons, successfully emulating genuine industry problems. Alternatively, structured rubrics in self- and peer-assessment on project delivery are effective in enhancing teaching-related professional skills among future TVET educators (Masek et al., 2021).

This study also suggests the exploration of possible novel learning methodologies might help to improve students teaching and learning experiences. The implementation of experiential learning projects, which need the application of theoretical knowledge to real-world industrial difficulties, may be facilitated by collaborative efforts with industry partners. This approach provides students with valuable hands-on experience and opportunities to engage in practical problem-solving. Mentorship program also have the potential to be implemented as it may facilitate the pairing of students with industry experts, who can provide advice and support throughout their Work-WBL endeavors. This collaboration has the capacity to enhance the entire educational experience. Promoting interdisciplinary cooperation among students hailing from distinct technical program helps foster a comprehensive comprehension of industrial processes and nurture a wide range of skill sets. Adaptability, self-management, and collaboration skills are among important competencies domain to effectively align TVET students with modern industry demands (Ana et al., 2022). Moreover, the incorporation of digital tools and e-learning platforms into educational settings can effectively support self-

directed learning, offer supplementary resources, and improve the overall learning experience. This approach is in line with the changing requirements of both the education sector and the industry in the contemporary digital era. Consistently, previous study by Ana et al. (2020) stated that proficiency in using digital tools is deemed critical and integrating ICT into teaching and professional communication helps in promoting effective learning interventions.

In conclusion, while this study highlights the positive impact of WBL on technological students' learning experiences, it also identifies areas for improvement. By addressing these areas and considering innovative learning strategies, Malaysian TVET institutions can further enhance the quality and effectiveness of their WBL programs especially for technological programs. This, in turn, will better prepare students for the challenges of the workforce and contribute to the nation's vision for a skilled and competent workforce.

Acknowledgment

This research was supported by Universiti Tun Hussein Onn Malaysia (UTHM) through Tier 1 (vot Q102).

References

Adan, N., Douni, R., & Hashim, H. (2021). Industry Perception on the implementation of Work-based learning (WBL) in Politeknik Ibrahim Sultan. Politeknik & Kolej Komuniti Journal of Social Sciences and Humanities, 6(1), 87-98.

Amadi, U. (2013). Appraising work-based learning experience of technical and vocational (teacher) educational and training (TVET) programmes in Nigeria. Mediterrean Journal of Social Sciences, 4(5), 137-146.

Ana, A., Kustiawan, I., Ahman, E., Zakaria, S., Muktiarni, M., Dwiyanti, V., Saripudin, S., & Kahoerunnisa, I. (2020). Defining vocational teacher competencies in industry 4.0 from the perspective of policymakers. Journal of Engineering Education Transformations, 34(Special Issue), 159–167. Scopus. https://doi.org/10.16920/JEET/2020/V34I0/157884

Ana, A., Kustiawan, I., Ahman, E., Zakaria, S., Muktiarni, M., Dwiyanti, V., & Khoerunnisa, I. (2022). Defining Vocational Teacher Competencies in Industry 4.0 from the Perspective of Teachers and Lecturers. Journal of Engineering Education Transformations, 35(Special Issue 2), 39–46. Scopus.

Boud, D., & Solomon, N. (2001). Work-based learning: A new Higher Education? Florence: Taylor & Francis.

Bryman, A., 2015, Social Research Method (5th Edition), Oxford University Press, Oxford UK.

Falconer, S. & Pettigrew, M. (2003). Developing added values skills within an academic programme through work-based learning. International Journal of Manpower, 24(1), 48-59, https://doi.org/10.1108/01437720310464963

Haruna, R., & Kamin, Y. (2019). Application of Work-based learning model in Technical and Vocational Education: A systematic review. Education, Sustainability and Society (ESS), 2(4), 1-4.

Krejcie, R. V. and Morgan D. W., "Determining sample size for research activities," Educational and Psyhcological Measurement, vol. 30, pp. 607-610, 1970.

Masek, A., Ismail, A., Nurtanto, M., & Hasim, S. (2021). Enhancing professional knowledge and self-concept through self and peer assessment using rubric: A case study for pre-services TVET teachers. Journal of Engineering Education Transformations, 35(1), 110–115. Scopus. https://doi.org/10.16920/jeet/2021/v35i1/22062

Mayombe C., (2023), Promoting youths' skills acquisition through experiential learning theory in vocational education and training in South Africa, Higher Education, Skills and Work-Based Learning, 13(4), https://doi.org/10.1108/HESWBL-10-2022-0216

Mat Tuselim, Y.R., Muhammad S., Mat M. F., Enhancing Graduate Employability Through Work-Based Learning (WBL) Approach In Civil Engineering Technology Programme, Jurnal Kejuruteraan, Teknologi and Sains Sosial, 3(1), 3-11

Noorazman, A., Tuan, A. T. A., Affero, I., Mohd, H. A., & Siti, N. F. M. N. (2017). Kerangka pembelajaran berasaskan proses kerja Kurikulum Standard Kolej Vokasional (KSKV) diploma vokasional Malaysia. Batu Pahat: Universiti Tun Hussein Onn Malaysia.

Pallant J. (2007), SPSS survival manual: A step-by-step guide to data analysis using SPSS for windows (version 10), Buckingham, UK: Open University Press, 2007.

Pylväs, L., Nokelainen, P. & Rintala, H. Vocational Students' Perceptions of Self-Regulated Learning in Work-Based VET. Vocations and Learning 15, 241–259 (2022). https://doi.org/10.1007/s12186-022-09286-8

Ramlee, M. (2017). Skills training and vocational education in Malaysia. In: Education in the Asia-Pacific region: issues, concerns and prospects, 3, 137-153. Singapore: Springer Nature.

Razali, S. S., Ismail, A., Ahmad, M. F., Hassan, W. A. S. W., Hashim, S., & Salleh, N. S. M. (2023). Validation of Multimedia Elements Based on Art Context Toward Technical and Vocational Education in the 21st-Century. Journal of Engineering Education Transformations, 37(1), 171–180. Scopus. https://doi.org/10.16920/jeet/2023/v37i1/23142

Shukurov, S. N. (2020). Methods of Education and Training of Work-Based Learning. International Journal of Progressive Sciences and Technologies (IJPSAT), 24(1), 380-384.

Salkind, N. J. (2011) Exploring Research (8th edition), Pearson Publication

Ugwoke, E., Ezeji, H., Edeh, N., & Etonyeaku, E. (2016). Effective Implementation of TVET-Industry Partnership for Employability through Work Integrated Learning in Nigerian University. Review of European Studies, 8(3), 307-315.

Wall, T., Hindley, A., Hunt, T., Peach, J., Preston, M., Hartley, C. and Fairbank, A. (2017), "Work-based learning as a catalyst for sustainability: a review and prospects", Higher Education, Skills and Work-Based Learning, Vol. 7 No. 2, pp. 211-224. https://doi.org/10.1108/HESWBL-02-2017-0014

Watisin, W., Ismail, N., & Mohamad Hashim, M. (2015). The problems of bilateral relations between educational institutions and industrial comittee towards Work-based learning in Malaysia. Procedia-social and Behavioral Sciences, 352-358.