Pre-Training Perceptions and Expected Career Outcomes: A Preliminary Study of Industrial Training Readiness, Expectations, and Concerns Among Students at Politeknik Sultan Idris Shah, Malaysia

Mohd Mohadir Harun, Noorazyla Binti Nasri, Mohd Khairul Nizam Bin Ismail

Politeknik Sultan Idris Shah, Selangor, Malaysia

DOI: https://doi.org/10.47772/IJRISS.2026.100400288

Received: 12 April 2026; Accepted: 17 April 2026; Published: 06 May 2026

ABSTRACT

Industrial Training is a compulsory component of Technical and Vocational Education and Training (TVET) in Malaysian polytechnics, providing students with structured workplace exposure prior to professional employment. Despite its recognised importance, limited research has explored how pre-training perceptions collectively shape anticipated career outcomes within the Malaysian polytechnic context. This preliminary study examined the level of and relationships among three pre-training constructs — readiness and knowledge, expectations of organisational support and work environment, and concerns about Industrial Training — and their associations with expected skills and career development outcomes. A quantitative ex-post facto design was adopted, involving 33 Semester 5 students at Sultan Idris Shah Polytechnic, Selangor, Malaysia, selected through simple random sampling. Data were collected using a 20-item structured questionnaire on a five-point Likert scale, adapted from established work readiness and employability frameworks. Reliability analysis produced an overall Cronbach's alpha of .962, confirming excellent internal consistency. Descriptive findings revealed that all four constructs were rated at a very high level (M = 4.39–4.64), reflecting broadly positive pre-placement orientations. Pearson correlation analysis demonstrated significant positive relationships between all three independent variables and expected career development outcomes: readiness and knowledge ($r = .661$, $p < .001$), organisational support expectations ($r = .621$, $p < .001$), and concerns ($r = .533$, $p = .002$). Multiple regression analysis indicated that the three predictors collectively accounted for 49.6% of the variance in expected career outcomes, $F(3, 26) = 8.519$, $p < .001$, Adjusted $R^2 = .438$. Although individual predictors did not reach statistical significance, likely due to multicollinearity arising from the small sample size, the overall model remained statistically robust. These findings provide initial directional evidence that pre-training perceptions encompassing readiness, workplace expectations, and psychological concerns are meaningful early driving factors of anticipated career development pathways. Future research with larger, multi-institutional samples is recommended to confirm and extend these preliminary findings.

Keywords: industrial training; work readiness; career development; TVET

INTRODUCTION

Malaysia has increasingly positioned TVET as a central pathway for developing a skilled workforce capable of addressing the demands of a rapidly changing economy (OECD, 2023; World Economic Forum, 2023). Unlike purely academic routes, TVET programmes prioritise applied competency and direct industry engagement, preparing graduates with the practical grounding required for effective workplace participation. This focus on vocational preparation has become closely tied to national employment goals, with TVET graduates viewed as essential contributors to sustainable economic growth. Reflecting this national priority, the Malaysian government introduced the National TVET Policy 2030, which sets out five strategic directions aimed at producing a technically proficient and economically productive workforce aligned with long-term development aspirations (National TVET Policy 2030, 2024).

In Malaysia, polytechnic education seeks to balance theoretical instruction with practical application through structured Industrial Training programmes. These programmes serve as an important vehicle for students to connect academic learning with the realities of working life, enabling them to develop key employability competencies such as communication, problem-solving, and technical proficiency (Basah et al., 2025; Bridgstock, 2021). Industrial Training is therefore not merely a supplementary requirement but a core developmental experience within the polytechnic curriculum (MD Sopi & Othman, 2024).

Research has consistently demonstrated that students do not enter the workplace with uniform levels of preparedness. Differences in how capable students perceive themselves to be, how confident they feel about their own abilities, and the degree to which their expectations match actual workplace conditions have all been identified as factors that shape readiness outcomes prior to Industrial Training (Yunos & Madar, 2025; Jackson, 2023).

Beyond individual readiness, students' expectations about the workplace also play a significant role in shaping engagement during training. When students anticipate receiving adequate supervision, relevant task assignments, and a supportive working atmosphere, they are more likely to invest meaningfully in their placement experience (Billett, 2011; MD Sopi & Othman, 2024). Conversely, when these expectations are not fulfilled, students may disengage from the learning process, which can ultimately affect how they perceive their own employability (Basah et al., 2025). In parallel, psychological concerns — including performance anxiety, fear of evaluation, and uncertainty about career direction — are recognised as additional factors that may either support or hinder the training experience (Yunos & Madar, 2025; Tomlinson & Holmes, 2021).

Although the significance of Industrial Training within polytechnic education is broadly acknowledged, studies that bring together students' readiness, expectations, and concerns within a single analytical framework remain sparse, particularly in the Malaysian context (Wong & Abdullah, 2025). This study therefore sought to examine the relationships between these three pre-training constructs and their collective influence on students' anticipated skills development and career progression.

Specifically, this study addressed the following research objectives:

1. To examine the level of students' perceptions of readiness and knowledge, organisational support and work environment, and expected skills and career development.

2. To examine the relationship between students' readiness and knowledge and their expected skills and career development outcomes from Industrial Training.

3. To investigate the relationship between students' expectations about organisational support and work environment and their expected skills and career development outcomes from Industrial Training.

4. To analyse the relationship between students' concerns about Industrial Training and their expected skills and career development outcomes.

LITERATURE REVIEW

Industrial Training as Work-Based Learning in Higher Education

Within higher education literature, Industrial Training is understood as considerably more than a brief workplace visit. It is designed as a purposeful learning experience in which students move beyond the classroom to actively build professional capability in genuine industry settings. Through involvement in real tasks and day-to-day interaction with working professionals, students are afforded opportunities to develop the kind of applied competence that formal instruction alone cannot readily provide (Jackson & Tomlinson, 2022).

Recent scholarship in higher education emphasises that the effectiveness of work-based learning hinges on the quality of student engagement rather than the duration of the placement alone. Students who take on substantive responsibilities and receive guided reflection opportunities tend to demonstrate more notable gains in

competency and a clearer sense of professional direction compared to those confined to observational roles (Wong & Abdullah, 2025; UNESCO-UNEVOC, 2022). This points to the importance of understanding not only what happens during Industrial Training but also how students enter the experience.

In TVET contexts, Industrial Training carries particular significance given the competency-driven nature of these programmes. Evidence from systematic reviews indicates that structured workplace learning simultaneously strengthens technical ability and develops broader professional attributes such as adaptability, teamwork, and communication (Basah et al., 2025). Nevertheless, outcomes are not uniform across students, even within comparable placement environments (MD Sopi & Othman, 2024). This variability has directed growing research attention towards the role that student-level factors play before placement begins, including pre-training perceptions, psychological readiness, and workplace expectations (Yunos & Madar, 2025).

Students' Readiness and Knowledge

Across the work-based learning literature, readiness is broadly understood as an internally held state of preparedness that influences how students approach and respond to workplace demands. Rather than referring solely to academic achievement, it captures the full range of attributes that a student brings to the industry environment, including relevant knowledge, technical capability, the confidence to act independently, and the professional attitudes needed to function effectively alongside colleagues and supervisors (Caballero & Walker, 2021; Lawton et al., 2023).

Contemporary research further highlights that readiness extends beyond technical mastery. Attributes such as adaptability, self-management, communication, and the ability to solve unfamiliar problems are equally relevant to how students navigate early workplace adjustment (Jackson & Tomlinson, 2022). Students who perceive themselves as well prepared are generally more willing to take initiative, actively seek feedback, and engage with challenging tasks during their placement. In TVET settings, where programmes are inherently skills-oriented, academic knowledge provides the foundation from which workplace task execution can begin. Students with a strong sense of knowledge readiness are better positioned to translate classroom learning into practical industry application (Wong & Abdullah, 2025), whilst those who feel underprepared may become hesitant or disengaged when confronted with unfamiliar professional demands (Yunos & Madar, 2025).

Expectations of Organisational Support and Work Environment

Whilst readiness refers to what students bring to the workplace from within, expectations concern what students anticipate finding once they arrive. In the period preceding Industrial Training, students typically form beliefs about the kind of supervisory guidance, task relevance, organisational atmosphere, and feedback they are likely to receive (Jackson & Tomlinson, 2022; De Vos et al., 2020). The extent to which these anticipatory beliefs align with actual experience has been shown to have a meaningful effect on students' learning engagement. When students expect to be given meaningful responsibilities and structured mentoring, their motivation to invest effort in the placement tends to be higher (MD Sopi & Othman, 2024).

When supervisors take an active role in guiding students — offering timely feedback and clear direction on tasks — students are more likely to perceive themselves as growing professionally during the placement period (Wong & Abdullah, 2025). However, when expectations exceed what the workplace actually provides, such as when students anticipate hands-on involvement but are instead assigned routine duties, their overall valuation of the training experience can diminish (Basah et al., 2025). In the present study, expectations are conceptualised as forward-looking beliefs that may shape how students anticipate their potential for skills development and career progression prior to beginning their placement.

Students' Concerns about Industrial Training

Alongside readiness and expectations, the psychological concerns that students carry into Industrial Training represent another important pre-placement factor. Moving from an educational environment to a professional one frequently gives rise to anxiety centred on performance assessment, adapting to workplace culture, and doubts about one's own competence (Yunos & Madar, 2025). Research indicates that a moderate degree of

concern can be functionally useful, as it may motivate students to prepare more carefully and approach tasks with greater attention to detail. However, when concern escalates into more pervasive anxiety, it can interfere with communication, reduce confidence, and limit a student's ability to absorb new learning during the placement (Coetzee, 2021; Lawton et al., 2023).

Within TVET settings, student concerns commonly centre on technical sufficiency and managing relationships with supervisors or co-workers (Basah et al., 2025). Students who harbour significant doubts about their abilities may instinctively avoid challenging assignments, thereby restricting the very developmental opportunities that Industrial Training is designed to provide. When left unaddressed, such concerns may shape how students estimate their potential to acquire meaningful skills or pursue employment after graduation. Concerns are therefore treated in this study as psychological antecedents that, depending on their nature and degree, may either facilitate or impede students' anticipated career-related outcomes.

Expected Skills and Career Development Outcomes

Career development outcomes within the context of Industrial Training are understood to encompass more than the acquisition of specific technical skills. They include students' perceptions of growth in professional confidence, clarity regarding future career direction, and a broader sense of readiness for employment (Jackson & Tomlinson, 2022). Evidence from recent Malaysian TVET research confirms that structured workplace exposure is associated with stronger employability perceptions and a more defined sense of vocational identity among students (Basah et al., 2025; Abdullah, 2025). Placements that involve genuine task responsibility and supportive supervisory relationships are particularly associated with higher levels of post-placement career confidence (Wong & Abdullah, 2025).

Importantly, these anticipated outcomes are not determined solely by what takes place during the placement itself. Students who approach Industrial Training with a strong sense of readiness, well-calibrated expectations, and manageable levels of concern tend to hold more favourable views of their likely career development trajectory before training even begins (De Vos et al., 2020). Yet despite growing recognition of readiness, expectations, and concerns as individually significant variables, research that examines all three simultaneously within a single framework — specifically in relation to anticipated career outcomes before placement — remains limited. Addressing this gap provides a more complete account of how pre-placement perceptions may collectively shape students' career development outlook.

Conceptual Framework of the Study

The conceptual framework underpinning this study draws on two established theoretical models. The first is the Work Readiness Model proposed by Caballero et al. (2011), which conceives graduate work readiness as a multidimensional construct spanning four interrelated domains: work competence, personal characteristics, organisational acumen, and social intelligence. This model informs the Readiness and Knowledge (RK) construct used in the present study, affirming that preparedness for the workplace encompasses not only technical knowledge but also attitudinal and interpersonal dimensions (Caballero & Walker, 2021). The second theoretical anchor is Vroom's (1964) Expectancy Theory, which proposes that individuals are motivated by anticipated outcomes — specifically, by their belief that effort will lead to performance, and that performance will be rewarded with valued results. In the context of Industrial Training, this theory supports the conceptualisation of both Expectations of Organisational Support (OS) and Concerns (CON) as cognitive antecedents: students' perceived value of the training experience is shaped by what they hope to encounter and what they are apprehensive about (De Vos et al., 2020; Jackson & Tomlinson, 2022).

As presented in Figure 1, this study proposes that three pre-training perceptual constructs — Readiness and Knowledge (RK), Expectations of Organisational Support and Work Environment (OS), and Concerns about Industrial Training (CON) — independently and collectively predict Expected Skills and Career Development Outcomes (SCD). The three independent variables are treated as theoretically interrelated, in keeping with evidence that readiness and expectation constructs tend to co-vary among students approaching their placement (Caballero & Walker, 2021; Basah et al., 2025). The framework has been contextualised for the Malaysian polytechnic TVET environment, in alignment with the National TVET Policy 2030 (National TVET Policy

2030, 2024), and is informed by recent empirical work on pre-training perceptions within the TVET domain (Yunos & Madar, 2025; Wong & Abdullah, 2025).

Figure 1: Conceptual Framework of the Study

INDEPENDENT VARIABLES **Readiness & Knowledge (RK)** **Expectations of Organisational Support & Work Environment (OS)** **Concerns about Industrial Training (CON)**	**→ Multiple Regression →**	**DEPENDENT VARIABLE** **Expected Skills & Career Development Outcomes (SCD)**

Source: Adapted from Caballero et al. (2011) and Jackson & Tomlinson (2022

METHODOLOGY

Research Design

This study employed a quantitative research design with an ex-post facto approach to examine the relationships between students' readiness and knowledge, expectations of organisational support and work environment, concerns about Industrial Training, and expected skills and career development outcomes. This design was deemed suitable given that the study aimed to examine differences that already existed within the student population — specifically in relation to their pre-training perceptions — without introducing any form of intervention or controlled condition. Since the variables of interest were naturally present and could not be experimentally assigned, an ex-post facto approach offered the most appropriate framework for observing and analysing these relationships as they occur in practice (Creswell & Creswell, 2023).

Sample and Sampling Procedure

The study population comprised Semester 5 students at Sultan Idris Shah Polytechnic (PSIS), Selangor, who were scheduled to undertake Industrial Training in the following semester. Simple random sampling was adopted as the selection method to ensure that every eligible student within the target population had an equal opportunity of being included in the study, thereby minimising the likelihood of systematic bias influencing the sample composition. A comprehensive list of qualifying students was obtained from the polytechnic's departmental records, and participants were subsequently drawn from this list through a random selection process. Given the exploratory and preliminary nature of the investigation, a sample of 30 students was considered appropriate for initial analysis (Hair et al., 2022).

Research Instrument

Data were gathered through a structured questionnaire comprising four constructs: (1) readiness and knowledge (RK), (2) expectations of organisational support and work environment (OS), (3) concerns about Industrial Training (CON), and (4) expected skills and career development outcomes (SCD). The instrument contained 20 items in total, with five items assigned to each construct, measured on a five-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). Items were adapted from established work readiness and employability frameworks and contextualised for the Malaysian polytechnic setting. A pilot study was conducted prior to full data collection to verify the clarity of item wording and establish face validity.

Data Analysis

Data were analysed using IBM SPSS Statistics (Version 29). The analytical process was carried out in four sequential stages. In the first stage, descriptive statistics — including mean scores and standard deviations —

were computed to determine the overall level of students' readiness, expectations, concerns, and expected career development outcomes. Mean scores were interpreted in accordance with the classification scale developed by Moidunny (2009), as presented in Table 1. In the second stage, reliability analysis using Cronbach's alpha was performed to assess the internal consistency of each construct. The third stage involved Pearson correlation analysis to evaluate the strength and direction of relationships among the four study variables. In the fourth and final stage, multiple linear regression analysis was conducted to determine the extent to which the three independent variables collectively and individually predicted expected career development outcomes. Statistical significance was set at the .05 level throughout.

Table 1: Mean Score Interpretation Scale (Moidunny, 2009)

Mean Score	Interpretation
4.21 – 5.00	Very High
3.21 – 4.20	High
2.61 – 3.20	Medium
1.81 – 2.60	Low
1.00 – 1.80	Very Low

RESULTS AND DISCUSSION

Reliability Analysis

Prior to the main analyses, the reliability of the research instrument was assessed using Cronbach's alpha. The complete 20-item instrument yielded an overall alpha of .962, indicating excellent internal consistency (Hair et al., 2022). Item-total correlations ranged from .534 to .870, all of which exceeded the minimum acceptable threshold of .30, confirming that each item contributed meaningfully to its respective construct. Construct-level reliability coefficients are summarised in Table 2.

Table 2: Summary of Construct Reliability

Construct	No. of Items	Cronbach's Alpha
All Constructs (Full Instrument)	20	.962
Readiness & Knowledge	5	.960–.961
Organisational Support & Work Environment	5	.959–.960
Concerns about Industrial Training	5	.961–.964
Expected Skills & Career Development	5	.960–.962

Research Objective 1: Descriptive Analysis

Descriptive statistics for all four constructs are presented in Table 3. Based on Moidunny's (2009) interpretation scale, all constructs were rated at a very high level. Expected Skills and Career Development recorded the highest mean score (M = 4.64, SD = 0.518), followed by Organisational Support and Work Environment (M = 4.57, SD = 0.608), Readiness and Knowledge (M = 4.41, SD = 0.675), and Concerns about Industrial Training (M = 4.39, SD = 0.670). Collectively, these results indicate that students approaching Industrial Training held

strongly positive perceptions across all dimensions, reflecting a high degree of anticipated capability, confidence in workplace support, awareness of potential challenges, and optimism regarding future career outcomes.

Table 3: Descriptive Statistics for All Constructs (N = 30)

Construct	N	Min	Max	Mean	SD	Interpretation
Readiness & Knowledge (RK)	30	3.00	5.00	4.41	0.675	Very High
Organisational Support & Work Environment (OS)	30	3.00	5.00	4.57	0.608	Very High
Concerns about Industrial Training (CON)	30	3.00	5.00	4.39	0.670	Very High
Expected Skills & Career Development (SCD)	30	2.40	5.00	4.64	0.518	Very High

Note: RK = Readiness & Knowledge; OS = Organisational Support & Work Environment; CON = Concerns; SCD = Expected Skills & Career Development.

The notably high mean for Expected Skills and Career Development points to the considerable optimism with which students in this sample approached their upcoming training. This is consistent with Basah et al. (2025) and Abdullah (2025), who observed that Malaysian polytechnic students generally hold a positive career outlook ahead of workplace engagement. The high mean for Organisational Support similarly reflects a strong expectation of receiving workplace mentoring and meaningful task involvement, a pattern also reported by MD Sopi and Othman (2024) among TVET students in comparable settings.

The very high mean score for Concerns (M = 4.39) warrants careful interpretation. Within the framing adopted in this study, concerns were not treated as indicators of debilitating anxiety but rather as a form of heightened awareness about the responsibilities and challenges that workplace entry entails. A high score on this dimension may reflect a constructive orientation — one in which students who are conscious of potential difficulties are also more motivated to prepare thoroughly (Coetzee, 2021). This interpretation aligns with Lawton et al. (2023), who noted that moderate anticipatory concern, when managed effectively, can function as a productive motivational force prior to placement.

Research Objective 2: Relationship Between Readiness and Knowledge and Expected Skills and Career Development

Pearson correlation analysis revealed a significant positive relationship between Readiness and Knowledge (MEAN_RK) and Expected Skills and Career Development (MEAN_SCD), $r(28) = .661$, $p < .001$ (see Table 4). This moderate-to-strong correlation indicates that students who perceived themselves as more academically and technically prepared were also more likely to anticipate positive skills development and career outcomes from their training. This finding is in line with Caballero and Walker (2021) and Wong and Abdullah (2025), who identified perceived work readiness as a meaningful predictor of anticipated employability outcomes. Students who enter the workplace with a solid knowledge base appear better equipped to translate their academic learning into practical competence, which in turn reinforces their sense of career confidence (Jackson, 2023).

Research Objective 3: Relationship Between Expectations of Organisational Support and Expected Skills and Career Development

A significant positive relationship was identified between Expectations of Organisational Support and Work Environment (MEAN_OS) and Expected Skills and Career Development (MEAN_SCD), $r(28) = .621$, $p < .001$ (Table 4). This finding suggests that students who anticipated greater supervisory guidance, task relevance, and a supportive working atmosphere were also more optimistic about the skills and career advancement they expected to gain through training. This is consistent with the findings of MD Sopi and Othman (2024) and Wong and Abdullah (2025), who highlighted the importance of expectation–experience alignment in shaping students' perceived training value. When students believe the workplace will provide structured support and meaningful

involvement, they become more motivated to engage actively in their learning, which in turn elevates their career development expectations (De Vos et al., 2020).

Research Objective 4: Relationship Between Concerns and Expected Skills and Career Development

A significant positive relationship was observed between Concerns about Industrial Training (MEAN_CON) and Expected Skills and Career Development (MEAN_SCD), r(28) = .533, p = .002 (Table 4). The positive direction of this correlation is theoretically meaningful and warrants careful interpretation. Rather than suggesting that heightened anxiety leads to greater career optimism, this finding reflects that students who were more aware of potential workplace challenges were also those who expressed stronger motivation to develop their skills and demonstrate their competence. This is consistent with Coetzee (2021), who argued that psychosocial awareness of one's own developmental gaps can orient students constructively towards career preparation. The constructive, rather than debilitating, nature of the concerns captured in this study may account for the positive direction of the relationship.

Table 4: Pearson Correlation Matrix (N = 30)

Variable	MEAN_RK	MEAN_OS	MEAN_CON	MEAN_SCD
MEAN_RK	1	.912**	.488**	.661**
MEAN_OS	.912**	1	.483**	.621**
MEAN_CON	.488**	.483**	1	.533**
MEAN_SCD	.661**	.621**	.533**	1

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

Multiple Regression Analysis

Multiple linear regression was performed with Readiness and Knowledge (MEAN_RK), Expectations of Organisational Support and Work Environment (MEAN_OS), and Concerns about Industrial Training (MEAN_CON) as predictors of Expected Skills and Career Development (MEAN_SCD). The overall regression model was statistically significant, F(3, 26) = 8.519, p < .001, accounting for 49.6% of the variance in expected career outcomes (R^2 = .496, Adjusted R^2 = .438). Results are summarised in Tables 5, 6, and 7.

Table 5: Multiple Regression Model Summary

Model	R	R^2	Adjusted R^2	Std. Error of the Estimate	F Change
1	.704	.496	.438	.389	8.519***

Note: Predictors: (Constant), MEAN_CON, MEAN_OS, MEAN_RK. Dependent Variable: MEAN_SCD. *** p < .001

Table 6: ANOVA

Model		Sum of Squares	df	Mean Square	F / Sig.
1	Regression	3.863	3	1.288	8.519 / .000
	Residual	3.929	26	.151	
	Total	7.792	29		

Note: Dependent Variable: MEAN_SCD. Predictors: (Constant), MEAN_CON, MEAN_OS, MEAN_RK.

Prior to examining individual predictor contributions, it was necessary to confirm that the regression model as a whole produced a meaningful and non-chance explanation of variance in Expected Skills and Career Development (MEAN_SCD) (Hair et al., 2022; Creswell & Creswell, 2023). The ANOVA serves this purpose by separating the total observed variance into two parts: the portion attributable to the three predictors combined (Regression Sum of Squares = 3.863, df = 3, Mean Square = 1.288) and the portion that remains unexplained (Residual Sum of Squares = 3.929, df = 26, Mean Square = .151), yielding a Total Sum of Squares of 7.792 (df = 29). The F-statistic is derived by dividing the regression mean square by the residual mean square, producing a value that can be tested for statistical significance. In this study, $F(3, 26) = 8.519$, $p < .001$, confirming that the three-predictor model explained a statistically significant proportion of variance in expected career development outcomes, accounting for 49.6% of the total variance in MEAN_SCD ($R^2 = .496$), which represents a moderate to substantial effect within the social sciences (Hair et al., 2022).

Table 7: Multiple Regression Coefficients

Predictor	**B**	**Std. Error**	**Beta (β)**	**t**	**Sig.**
(Constant)	1.884	.604	—	3.121	.004
Readiness & Knowledge (RK)	.372	.264	.484	1.410	.170
Organisational Support & Work Env. (OS)	.040	.291	.047	.139	.891
Concerns (CON)	.212	.124	.274	1.709	.099

Note: Dependent Variable: MEAN_SCD.

Whilst the model as a whole accounted for a substantial proportion of variance, none of the individual predictors reached statistical significance at the $p < .05$ level: Readiness and Knowledge ($B = .372$, $\beta = .484$, $t = 1.410$, $p = .170$), Organisational Support ($B = .040$, $\beta = .047$, $t = .139$, $p = .891$), and Concerns ($B = .212$, $\beta = .274$, $t = 1.709$, $p = .099$). This pattern — whereby the combined model is significant but individual coefficients are not — is characteristic of multicollinearity, a statistical condition that arises when predictor variables share high intercorrelations (Hair et al., 2022). The particularly strong correlation between MEAN_RK and MEAN_OS ($r = .912$) suggests that these two constructs may share considerable conceptual overlap, an issue that warrants more rigorous instrument validation in future work.

Notwithstanding the non-significant individual predictors, the standardised beta coefficients offer useful insight into relative predictor weight. Among the three variables, Readiness and Knowledge demonstrated the largest standardised beta ($\beta = .484$), followed by Concerns ($\beta = .274$) and Organisational Support ($\beta = .047$). These values indicate that, when the other predictors are statistically controlled for, students' self-perceived readiness exerted the strongest directional influence on expected career development outcomes. This is consistent with Jackson (2023) and Caballero and Walker (2021), who identified readiness as the principal individual-level driver of career development anticipation.

Given the preliminary nature of this investigation and the modest sample size ($N = 30$), these findings should be treated as indicative rather than definitive. A larger sample in future research would improve statistical power, enable independent predictor effects to be detected more reliably, and permit the use of diagnostic tools such as Variance Inflation Factor (VIF) analysis. Nevertheless, the collective explained variance of 49.6% across the three constructs underscores the practical value of examining pre-training perceptions as a combined framework for understanding students' anticipated career outcomes.

CONCLUSION

This preliminary study examined the associations between pre-training perceptions and expected career development outcomes among Semester 5 students at Sultan Idris Shah Polytechnic. It explored the roles of readiness and knowledge, expectations of organisational support and work environment, and concerns about

Industrial Training as potential antecedents of expected skills and career development outcomes. Given the exploratory scope and small sample (N = 30), the findings presented here are intended to provide initial directional evidence and should not be interpreted as conclusive.

Descriptively, all four constructs were rated at a very high level (M = 4.39–4.64), indicating broadly positive pre-placement orientations among students in this sample. Pearson correlations indicated significant positive relationships between all three independent variables and expected career outcomes, offering preliminary evidence that readiness, expectations, and concerns may each be associated with students' anticipated training value. The overall regression model was statistically significant, $F(3, 26) = 8.519$, $p < .001$, collectively explaining 49.6% of the variance in SCD (Adjusted $R^2 = .438$). Individual predictors did not reach significance at the $p < .05$ level, most likely attributable to multicollinearity associated with the small sample and high construct intercorrelations. These results are suggestive rather than confirmatory and should be treated accordingly.

The findings tentatively suggest that pre-training perceptions may be a relevant area of focus in polytechnic Industrial Training preparation. The three constructs examined appear to be associated, at least at the correlational level, with how students anticipate their career-related outcomes from training. These preliminary patterns merit further investigation before any firm conclusions or institutional recommendations can be drawn.

This study is subject to a number of limitations that should be considered when interpreting the findings. The use of 30 participants drawn from a single institution limits the extent to which the results can be generalised to other polytechnic settings or student populations. Furthermore, as perceptions were measured at a single point in time using self-report data, it is not possible to draw conclusions about causality or to track how these perceptions evolve across the training period. The notably high correlation observed between readiness and expectations constructs ($r = .912$) raises questions about whether these two variables are sufficiently distinct from one another, which points to a need for more thorough instrument refinement in subsequent work.

To build on these preliminary findings, future studies should consider drawing from multiple institutions to improve representativeness, employing longitudinal approaches that follow students from pre- to post-placement, and applying structural equation modelling to examine the proposed relationships with greater analytical rigour. The inclusion of additional constructs such as self-efficacy (Suyitno et al., 2025) and academic motivation may further enrich the explanatory framework. The present study is best understood as a starting point for deeper inquiry into pre-training perceptions and their potential relationship with Industrial Training outcomes in the Malaysian polytechnic TVET context.

REFERENCES

1. Abdullah, N. (2025). Graduate employability trends at Politeknik Sultan Idris Shah (2021–2023): A three-year performance review. International TVET Academic & Research Symposium Proceedings.
2. Basah, N. A. S. H., Mohd Noor, M. A., & Ahmad, A. M. (2025). Graduate attributes and employability skills in TVET in Malaysia: A systematic review. Management Research Journal, 14(2), 100–119.
3. Billett, S. (2011). Vocational education: Purposes, traditions and prospects. Springer.
4. Bridgstock, R. (2021). Employability and career development learning through work-integrated learning. Journal of Teaching and Learning for Graduate Employability, 12(1), 1–15.
5. Caballero, C. L., Walker, A., & Fuller-Tyszkiewicz, M. (2011). The Work Readiness Scale (WRS): Developing a measure to assess work readiness in college graduates. Journal of Teaching and Learning for Graduate Employability, 2(2), 41–54. https://doi.org/10.21153/jtlge2011vol2no2art548
6. Caballero, C. L., & Walker, A. (2021). Work readiness in graduate recruitment and selection: A review of current assessment methods. Journal of Education and Work, 34(2), 123–139. https://doi.org/10.1080/13639080.2020.1841662
7. Coetzee, M. (2021). Graduates' psychosocial employability attributes and career adaptability. Higher Education Research & Development, 40(3), 503–517. https://doi.org/10.1080/07294360.2020.1735336
8. Creswell, J. W., & Creswell, J. D. (2023). Research design: Qualitative, quantitative, and mixed methods approaches (6th ed.). SAGE Publications.

9. Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2022). A primer on partial least squares structural equation modeling (PLS-SEM) (3rd ed.). SAGE Publications.
10. Jackson, D. (2023). Developing career readiness in higher education: The importance of work-integrated learning. Higher Education Research & Development, 42(4), 879–892. https://doi.org/10.1080/07294360.2022.2101243
11. Jackson, D., & Tomlinson, M. (2022). Investigating the relationship between career planning orientation, career management competencies and perceived employability in undergraduates. Higher Education, 83(4), 819–839.
12. Lawton, K., Wright, T., & Shawe, J. (2023). Students' self-assessment of employability: The role of placement learning and work-based learning. Journal of Further and Higher Education, 47(3), 387–400.
13. MD Sopi, N. A., & Othman, H. (2024). Communication skills of vocational college students after completing industrial training. Research and Innovation in Technical and Vocational Education and Training, 4(2), 77–85.
14. Moidunny, K. (2009). The effectiveness of the National Professional Qualification for Educational Leaders (NPQEL) [Doctoral dissertation, Universiti Kebangsaan Malaysia].
15. National TVET Policy 2030. (2024). Dasar TVET Negara 2030. Edisi 1. https://mohon.tvet.gov.my/manual/MTVET_DASAR_TVET_NEGARA_2030.pdf
16. OECD. (2023). OECD skills outlook 2023: Skills for a resilient green and digital transition. OECD Publishing. https://doi.org/10.1787/27452f0b-en
17. Suyitno, S., Nurtanto, M., Jatmoko, D., Widiyono, Y., Purwoko, R. Y., Abdillah, F., Setuju, & Hermawan, Y. (2025). The effect of work-based learning on employability skills: The role of self-efficacy and vocational identity. European Journal of Educational Research, 14(1), 309–321. https://doi.org/10.12973/eu-jer.14.1.309
18. Tomlinson, M., & Holmes, L. (2021). Graduate employability and the expansion of higher education. Higher Education, 82(4), 771–787.
19. UNESCO-UNEVOC. (2022). Transforming TVET for successful and just transitions. UNESCO. https://unevoc.unesco.org
20. Vroom, V. H. (1964). Work and motivation. Wiley.
21. Wong, K. T., & Abdullah, A. H. (2025). Work-based learning effectiveness in Malaysian polytechnic programmes: A learner-centred perspective. Journal of TVET Research, 6(1), 44–59.
22. World Economic Forum. (2023). The future of jobs report 2023. World Economic Forum. https://www.weforum.org/reports/the-future-of-jobs-report-2023
23. Yunos, J. M., & Madar, A. R. (2025). Are Malaysia's graduates prepared for the Fourth Industrial Revolution workforce? A systematic literature review. Online Journal for TVET Practitioners, 10(1), 97–110.