Employability challenges of vocational college graduates in the state of Johor

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Abstract: The purpose of this research is to determine the difficulties experienced by Vocational College (VC) graduates in selecting a job, aligning their study program with the career, and figuring out the abilities that employers want depending on factors such as gender, study program, and VC after graduation. 234 graduates of Electrical Technology, Electronic Technology, Welding Technology, Construction Technology, and Automotive Technology programs from 2020 to 2022 VC in Johor participated in the study. This study used a quantitative survey research approach, utilizing a questionnaire and simple random sampling to analyze data both descriptively and inferentially against a sample representative of the total population. The findings demonstrated that graduates have significant difficulties selecting a vocation, determining if their study program is suitable, and determining what qualities companies are looking for. The results of the Mann-Whitney U and Kruskal Wallis tests showed that there is gender-based variations in the abilities and problems associated with choosing a vocation. The degree of difficulty in matching studies with jobs, compatibility of studies with careers, and the abilities employers want depending on the study program did not change based on a person's gender. Finally, depending on VC, notable variations were discovered in the degree of career choices, program fit, and skills needed by employers.

Keywords: Industry 4.0; TVET; Career selection; Employers

1. Introduction

With the advent of IR 4.0 in Malaysia's industrial sector, which highlights the growth and development of industrial technology to address the issue of low productivity by introducing cutting-edge technology like automation, digitization, and information technology, the industry's use of advanced technology is becoming more sophisticated (Mamat et al., 2019). This is because it actively produces VC graduates to create a skilled workforce and can perform a variety of jobs to meet the needs of the industry requiring skilled workers in Malaysia, Malaysia is one of the fastest developing countries in Southeast Asia (Makhtar et al., 2016).

The 8th Prime Minister of Malaysia expressed his intention to target 35% of Vocational College (VC) graduates who are highly skilled and competent in skills for the development of Malaysia's rapidly developing industrial economy by 2030 through the strategic plan Wawasan Kemakmuran Bersama (WKB) (S. M. Amin et al., 2023). (Shahzad et al., 2023) claims that the globalization era has changed the industrial sector in Malaysia and presented a challenge where employers in the industry must employ a skilled and competent workforce because the industrial age now emphasizes highly sophisticated and advanced technological systems like automation robotics in line with Malaysia's ongoing IR 4.0 development.

The reality is not what is expected, with problems including graduates not being considered for jobs and companies in the field needing certain communication abilities. To increase quality and meet industrial demands, the government and private sector must structure, integrate, and restructure the TVET system to solve these issues. Early research revealed that instructors at Johor's Vocational Colleges and graduates alike concur those graduates encounter difficulties selecting their careers following VC. To solve these problems and develop a more prosperous and competitive industrial sector, the public and private sectors must collaborate.

VC graduates attend their institution for four years, or eight semesters, of Technical and Vocational Studies and Training (TVET). They are awarded the Malaysian Vocational Diploma (DVM) and the Malaysian Vocational Certificate (SVM) upon completion of their education. The two-year certificate program consists of five-month courses and two years of study time, together with a five-month industrial training or on-the-job training (OJT). Students make decisions about their careers depending on their interests, goals, and the professional path and future that best suit their subject of study or program at VC schools. According to (Abd Rahman et al., 2020), graduates would want to select a job that fits their separate curricula when enrolled at VC. However, they would question whether businesses hire recent graduates with less than a year of experience and if the minimum pay rate is constant.

Vocational colleges currently offer curriculum and training that is out of step with the rapid speed of technological innovation and evolving industry demands (Abd Razak et al., 2022), which has sparked discussions on a number of fronts. This situation calls for the analysis of skill gaps, the development of future-ready skills, the improvement of teacher preparation, the guarantee of equal access to education, and the promotion of policy changes (Ramadass & Lakshmi, 2024). It also calls for the integration of developing technology into vocational education. In order to properly prepare students for the shifting demands of the labour market, addressing this mismatch necessitates updating teaching methodologies, modifying educational approaches, and placing an emphasis on skills beyond technical proficiency (Varma & Malik, 2023). The overall goal of these talks is to close the knowledge gap between industry demands and education, equipping students for the ever-changing workforce of the twenty-first century. Objectives of the study:

(i) To identify the difficulties in choosing a career for Vocational College graduates in Johor
(ii) To identify the compatibility of study programs for careers
(iii) To find out the skill level that employers require of VC graduates
(iv) To see the variations in career challenges, program compatibility, and industry skills that employers require

2. Methods

This study uses a quantitative technique with a survey research design. A quantitative technique that is both descriptively and inferentially analysed is used in this survey investigation. Research tools in the form of questionnaires are used to gather the findings of the researcher's study.

The population of 576 graduates from Johor's VC who studied TVET programs in electrical, electronic, construction, welding, and automotive technology between 2020 and 2022 is the subject of this study. The participants involved in this research have willingly consented to complete the research questionnaire, and the data provided is eligible for publication.

There was an equal chance of selection for every member in the basic random sampling procedure. Using Krejcie and Morgan's study sample determination table, the researcher

examined the population size to arrive at a sample size of 234 graduates. The study sample size was split. High levels of internal and external validity are ensured by this procedure in the survey findings.

3. Results

234 graduates from 6 VC in the state of Johor, who studied the primary TVET study programs in electrical technology, electronics technology, welding technology, and automotive technology, made up the respondents in this survey. There are 116 (49.6%) male respondents and 118 (50.4%) female respondents because of the descriptive analysis that was conducted. The number and percentage of responders by gender are displayed in Table 1. 118 female grads (50.4%) make up the bulk of the graduates, while 116 male graduates (49.6%) make up the remainder.

Table 1. Number and percentage of respondents by gender

Gender	Number	Percentage (%)
Male	116	**49.6**
Female	118	**50.4**
Total	**234**	**100**

The level of compatibility of studies with the careers of graduates who have worked in their respective fields in the state of Johor is displayed in Table 3. The KS5 item "My studies are useful for finding a suitable job after graduation" has the highest Strongly Disagree frequency score, with a mean score of 1.56 and a standard deviation of .734. Regarding how well the studies fit into the occupations of graduates who are not very successful in their areas, two items on this section were found to share the second-highest ranking. Table 3 displays item KS6: "My studies are useful to fulfil my professional duties now" and item KS11: "I was able to use the skills learned during my studies in the same field of work" as the second and third most highly ranking questions. Furthermore, the item "My qualification/diploma level corresponds to my current job" is the lowest on the KS1 list, with a mean value of 1.86 and a standard variation of .634. The value is at a high level even though item KS2 is positioned lower in relation to table 3. In the state of Johor, it is evident that most graduates find it difficult to connect their educational background with high-level professional experience in their respective disciplines. Overall, the results indicate that level of compatibility of studies with the careers of graduates who have worked in their respective fields in the state of Johor is very high with mean score of 1.68 and standard deviation of .730.

Next, for the skill levels required by employers of VC graduates for 5 programs in the state of Johor referring to table 4, the average mean score is at a very high trend level. The highest Strongly Disagree frequency score is the K9 item "Willingness to question other people's ideas" with a mean value of 1.57 and a standard deviation of .745. The second highest Strongly Disagree frequency score is K10 item "I have the ability to work under pressure" with the mean score of 1.63 and standard deviation of .834. Meanwhile, the lowest Strongly Disagree frequency score is K1 item "I can master special field/knowledge in the subject taken" mean score of 1.88 and standard deviation of .705. VC graduates in Johor remain at a high level challenge for the skills required by the employers.

Table 2. Level of challenges in career selection of graduates for 5 study programs in the

Item	Statements	SD		D		LA		A		SA		Mean score	Standard Deviation	Level
		f	%	f	%	f	%	f	%	f	%			
PK1	I was not unemployed after completing the training program because I was accepted for work.	94	40.2	127	54.3	1	0.4	7	3.0	5	2.1	1.73	.804	Very high
PK2	I was offered a suitable starting salary by the employer.	88	37.6	135	57.7	0	0	8	3.4	3	1.3	1.73	.747	Very high
PK3	I meet the criteria desired by the employer.	101	43.2	121	51.7	0	0	10	4.3	2	.9	1.68	.761	Very high
PK4	I master speaking skills in English.	104	44.4	117	50.0	7.0	3	6	2.6	0	0	1.64	.668	Very high
PK5	I have skills in the job I want to do.	55	23.5	75	32.1	1	.4	64	27.4	39	16.7	2.82	1.475	Moderate
PK6	I have knowledge in the job I want to do.	99	42.3	122	52.1	0	0	11	4.7	2	.9	1.70	.774	Very high
PK7	I am good at communicating.	88	37.6	133	56.8	2	.9	9	3.8	2	.9	1.74	.740	Very high
PK8	I easily understand the tasks given.	90	38.5	131	56.0	3	1.3	7	3.0	3	1.3	1.73	.748	Very high
PK9	I have a persuasive personality.	99	42.3	122	52.1	3	1.3	9	3.8	1	.4	1.68	.726	Very high
PK10	I have skills that match the job I'm applying for.	98	41.9	124	53.0	2	.9	8	3.4	2	.9	1.68	.737	Very high
PK11	I don't have to compete with graduates from other educational institutions in getting a job.	114	48.7	110	47.0	2	.9	5	2.1	3	1.3	1.60	.735	Very high
PK12	I master the knowledge related to the current world in the field of work.	105	44.9	116	49.6	4	1.7	8	3.4	1	.4	1.65	.721	Very high
Average Score												**1.78**	**.804**	**Very High**

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Table 3. Level of compatibility of studies with the careers of graduates who have worked

Item	Statements	SD		D		LA		A		SA		Mean score	Standard Deviation	Level
		f	%	f	%	f	%	f	%	f	%			
KS1	My qualification/diploma level matches my current job.	53	22.6	170	72.6	3	1.3	6	2.6	2	.9	1.86	.634	High
KS2	My current job is commensurate with my knowledge.	60	25.6	162	69.2	3	1.3	8	3.4	1	.4	1.84	.648	High
KS3	My current job matches my skills.	95	40.6	128	54.7	2	.9	8	3.4	1	.4	1.68	.701	Very High
KS4	My field of study is in line with my current job.	106	45.3	117	50.0	2	.9	8	3.4	1	.4	1.64	.712	Very High
KS5	My studies are useful to find a sufficient job after graduation.	125	53.4	96	41.0	4	1.7	8	3.4	1	.4	1.56	.734	Very High
KS6	My studies are useful to fulfill my current professional duties.	112	47.9	109	46.6	6	2.6	5	2.1	2	.9	1.62	.772	Very High
KS7	My studies are useful for my future professional/career development.	104	44.4	117	50.0	4	1.7	5	2.1	4	1.7	1.67	.770	Very High
KS8	My studies are useful for the development of my personality.	101	43.2	120	51.3	1	.4	8	3.4	4	1.7	1.69	.797	Very High
KS9	My studies are useful for the economic development of my country.	101	43.2	120	51.3	1	.4	8	3.4	4	1.7	1.69	.797	Very High
KS10	I can use the knowledge learned during my studies in the same field of work.	108	46.2	114	48.7	2	.9	7	3.0	3	1.3	1.65	.763	Very High
KS11	I was able to use the skills learned during my studies in the same field of work.	113	48.3	108	46.2	3	1.3	7	3.0	3	1.3	1.63	.771	Very High
KS12	I am studying at a college that uses the latest technology along with the development of the industry.	111	47.4	111	47.4	4	1.7	7	3.0	1	.4	1.62	.710	Very High
Average Score												**1.68**	**.730**	**Very High**

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Table 4. Skill levels required by employers of VC graduates for 5 programs in the state of Johor

Item	Statements	SD		D		LA		A		SA		Mean score	Standard Deviation	Level
		f	%	f	%	f	%	f	%	f	%			
K1	I can master the field/specific knowledge in the subject taken.	55	23.5	166	70.9	1	.4	9	3.8	3	1.3	1.88	.705	High
K2	I have the ability to develop new ideas.	76	32.5	144	61.5	3	1.3	8	3.4	3	1.3	1.79	.742	Very High
K3	I have the ability to develop new solutions.	92	39.3	129	55.1	3	1.3	8	3.4	2	.9	1.71	.735	Very High
K4	I have the ability to be firm in using my authority.	112	47.9	109	46.6	2	.9	9	3.8	2	.9	1.63	.763	Very High
K5	I have the ability to adapt to often changing situations.	115	49.1	105	44.9	1	.4	8	3.4	5	2.1	1.65	.838	Very High
K6	I have the ability to mobilize the capacity of others.	95	40.6	126	53.8	5	2.1	8	3.4	0	0	1.68	.683	Very High
K7	I have an analytical mind.	90	38.5	132	56.4	3	1.3	8	3.4	1	.4	1.71	.700	Very High
K8	Willingness to question my ideas.	76	32.5	145	62.0	2	.9	9	3.8	2	.9	1.79	.722	Very High
K9	Willingness to question other people's ideas.	125	53.4	96	41.0	3	1.3	9	3.8	1	.4	1.57	.745	Very High
K10	I have the ability to work efficiently towards goals.	117	50	103	44.0	1	.4	9	3.8	4	1.7	1.63	.824	Very High
K11	I have the ability to organize my work process efficiently.	102	43.6	119	50.9	1	.4	10	4.3	2	.9	1.68	.767	Very High
K12	I have the ability to organize my work process efficiently.	99	42.3	122	52.1	1	.4	9	3.8	3	1.3	1.70	.779	Very High
K13	I have the ability to work under pressure.	114	48.7	107	45.7	2	.9	6	2.6	5	2.1	1.64	.813	Very High
Average Score												**1.70**	**.76**	**Very High**

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Table 5 reveals the level of graduate career selection for 5 programs based on gender in the state of Johor. Most female face a high level of career challenge, with 99 female graduates and 77 male graduates. The high-level of career challenge was faced by 26 male and 19 female graduates, followed by two male graduates in the middle, nine male graduates in the low level, and two males in the very low level.

Table 5. Challenge level of graduate career selection for 5 programs based on gender in the state of Johor

Gender	Level														
	Challenge					Compatibility					Skill				
	VH	H	M	L	VL	VH	H	M	L	VL	VH	H	M	L	VL
Male	77	26	2	9	2	95	9	2	8	2	94	9	1	7	5
Female	99	19	0	0	0	110	8	0	0	0	106	12	0	0	0
Total	**176**	**45**	**2**	**9**	**2**	**205**	**17**	**2**	**8**	**2**	**200**	**21**	**1**	**7**	**5**

The level of study compatibility with careers challenge was higher for women, with 110 female graduates and 95 male graduates. The high-level challenge of career compatibility was found for nine male and eight female graduates, while the lowest level was faced by two male graduates in the middle, eight male graduates in the low level, and two males in the very low level.

The challenge of level of skills required by employers based on gender in Johor is higher for women than for men, with 106 female graduates and 94 male graduates at the very high level. Both female and male graduates have a high trending level of 12, while the remaining graduates are at the middle level, seven male graduates in the low level, and five men in the very low level. In conclusion, all male and female graduates in Johor face a high level of career selection challenges.

Table 6. Level of challenges in career selection of graduates for 5 programs based on study programs in the state of Johor

Education program	Level														
	Challenge					Compatibility					Skill				
	VH	H	M	L	VL	VH	H	M	L	VL	VH	H	M	L	VL
Electrical Technology	42	10	0	4	0	49	3	0	2	2	48	4	0	3	1
Electronic Technology	40	5	0	2	0	44	1	0	2	0	42	3	0	1	1
Construction Technology	40	13	0	1	1	48	6	1	0	0	47	6	0	0	2
Welding Technology	34	8	2	2	1	37	5	1	4	0	37	5	1	3	1
Automotive Technology	20	9	0	0	0	27	2	0	0	0	26	3	0	0	0
Total	**176**	**45**	**2**	**9**	**2**	**205**	**17**	**2**	**8**	**2**	**200**	**21**	**1**	**7**	**5**

Table 6 shows that the majority of Electrical Technology study programs in Johor have a very high graduate career choice challenge level of 42 graduates. The second highest ranking is the Electronic Technology and Construction Technology program, with 40 graduates facing the challenge of choosing a career at a very high level. Two Welding Technology program graduates are

at a moderate level. The majority of Electrical Technology programs have a high degree of compatibility with careers challenge with 49 graduates. The second highest ranking is the Construction Technology program, with 48 graduates facing the challenge of reconciling studies with careers based on a program of study at a very high level. The level of skills required by employers challenge based on the program of study in Johor is highest for Electrical Technology at 48 graduates. The second-highest study program is Construction Technology, with 47 graduates, not less than the difference between graduates of the Electrical Technology study program. The majority of graduates face challenges in the skills required by employers based on a program of study in Johor at a very high level.

Table 7. Normality test

Kolmogorov-Smirnov			
Item	**Statistic**	**df**	**Sig.**
Career choice	.276	234	.000
Appropriateness of studies	.325	234	.000
Skills needed by employers	.318	234	.000

The non-parametric normality test (Kolmogorov-Smirnov) is used to determine if descriptive values are normal or abnormal, and it is displayed in Table 7. The descriptive value is typical if the value is significant (P>.05). The descriptive value, however, is not typical if the value is significant (P<.05). Table 7 presents the normality test findings. The significant value is .000 (P<.05). Thus, it is possible to conclude that this study's descriptive value is abnormal.

The study examines the differences in career selection challenges, the compatibility of study programs with careers, and the skills required by employers based on gender. Non-Parametric tests were used to assess these differences. The hypotheses were H_0: There is no difference in career selection challenges, matching study programs with careers, and the skills required by employers based on gender, and Ha: There is a difference in the level of challenges in choosing a career, the compatibility of study programs with careers, and the skills required by employers based on gender.

Table 8. Differences in the level of challenges in career selection, suitability of study programs and skills required by employers based on gender

Item	Selection of Career	Appropriateness of Studies	Skills Needed by Employers
Mann-Whitney U	5327.500	6311.00	6626.500
Wilcoxon W	12348.500	13097.000	13647.500
Z	-2.954	-1.040	-.423
Asymp.Sig. (2-tailed)	.003	.298	.673

Based on Table 8, the data analysis revealed that the challenge level of career selection based on gender was significant (U=5327.500, Z=2.954, r=.193), rejecting the hypothesis (H_0) as there was no difference in career selection challenges. The challenge level matching study programs with careers based on gender was not significant (U=6311, Z=1.040, r=.068), accepting the hypothesis (H_0) as there was no difference in matching study programs with careers based on gender. The skill challenge level required by employers in the industry based on gender was not significant (U=6626.500, Z=.423, r=.028), accepting the hypothesis (H_0) as there was no difference in the level of skill challenges required by employers in the industry based on gender.

Table 9. Differences in the level of challenges in choosing a career, the appropriateness of the study program and the skills required by the employer based on the study program

Item	Selection of Career	Appropriateness of Studies	Skills Needed by Employers
Kruskal-Wallis H	7.593	2.512	4.691
df	4	4	4
Asymp. Sig.	.108	.643	.320

Table 9 uses the Kruskal Wallis analytical test to show the variations in study program fit, employer-required abilities, and problems associated with choosing a vocation. The following are the hypotheses: H_0: There is no difference in the level of challenges in choosing a career, matching the study program with the career and skills required by the employer based on the study program; and Ha: There is a difference in the level of challenges in choosing a career, suitability of the study program with the career and skills required by the employer based on the study program.

The data analysis revealed that the challenge level of career selection based on study programs was not significant (U=7.593, df=4) and the value of Asymp. Sig. .108 (P>.05), accepting the hypothesis (H_0) as there was no difference in career selection challenges. The challenge level matching study programs with careers based on porgram was not significant (U=2.512, df=4) and the value of Asymp. Sig. .643 (P>.05), accepting the hypothesis (H_0) as there was no difference in matching study programs with careers based on program. The skill challenge level required by employers in the industry based on program was not significant (U=4.691, df) and the value of Asymp. Sig. .320 (P>.05), accepting the hypothesis (H_0) as there was no difference in the level of skill challenges required by employers in the industry based on program.

Table 10. Differences in the level of challenges in career selection, suitability of study programs and skills required by employers based on VC

Item	Selection of Career	Appropriateness of Studies	Skills Needed by Employers
Kruskal-Wallis H	60.857	102.435	71.938
df	5	5	5
Asymp. Sig.	.000	.000	.000

Table 10 presents the variations in the problems associated with choosing a job, the appropriateness of study plans, and the abilities employers want depending on VC. Based on VC, the Kruskal Wallis analysis was performed to see if there is a significant difference. The following are the hypotheses: H_0: There is no difference in the level of challenges in choosing a career, matching the study program with the career and skills required by the employer based on the Vocational Colleges. Ha: There is a difference in the level of challenges in choosing a career, suitability of the study program with the career and skills required by the employer based on the Vocational Colleges.

The value of the career selection difficulty level based on VC (N=234) is U=60.857, df=5. Since there is a difference in the degree of difficulty in choosing a vocation, the hypothesis (H_0) is rejected when the value of Asymp. Sig. .000 (P<.05) indicates a significant difference. Based on VC (N=234), the number of obstacles in aligning study plans with careers has a value of U=102.435, df=5. Since there is a difference in the degree of obstacles connecting the study

program with a profession based on VC, the hypothesis (H_0) is rejected when the value of Asymp. Sig. .000 (P<.05) indicates a significant difference. While, on the industry's skill challenge level requirements have a value of (N=234) U=71.938, df=5. Employers in the sector expect different levels of skill difficulties according on VC, therefore if the value of Asymp. Sig. .000 (P<.05) indicates a significant difference, the hypothesis (H_0) is rejected.

4. Discussion

The difficulties in choosing a career for VC graduates in Johor

The study reveals that VC graduates face high employability challenges in career selection based on gender, study program, and VC after completing their studies. Most graduates face problems to compete with graduates from other educational institutions in getting a job, as they must compete with other skill institutions in Malaysia like Community College (CC) and Youth and National Skills (YNS) to produce human capital of calibre and competence in doing a job with skills.

The graduates who have just completed their studies will face challenges in choosing a career because they must compete for jobs and meet the needs of the industry (Ministry of Education Malaysia, 2018). The graduates with skills and competencies will have an advantage in employability desired by employers in the industry (S. M. A. Amin & Adenan, 2021). VC graduates also face challenges related to mastering speaking skills in English, as most do not agree that they have mastered speaking in the industry. This is due to their lack of practice using English communication in daily life (Hanapi, 2015). The graduates are too shy to speak in English as the main reason for their poor English proficiency (Nesaratnam et al., 2020). Although graduates have excellent academic results, they are less able to argue or communicate in English, which will not attract the interest of employers in the industry, as the industry now uses English as the official language for daily work activities (Mat Husin & Mohd Radzuan, 2021).

The study also reveals that female graduates face a significant challenge in choosing a graduate career for five programs in Johor, with 99 female graduates and 77 male graduates. This is due to employers' trust in the industry towards women in physical energy-related jobs (Shatilova et al., 2021). The highest level of VC graduates is found in the Electrical Technology and Electronic Technology study programs, with 42 and 40 graduates respectively. These programs face challenges in career selection due to weak job skills (Olojuolawe et al., 2022). In Batu Pahat VCs, 51 graduates are at a high level compared to other VC, due to differences in imparting knowledge and skills in VC. This is due to differences between lecturers in imparting technology-related knowledge to students. The increase in students in Malaysia does not follow the projected employment requirements in the industry, as the labour supply exceeds the job market demand. This lack of job opportunities may lead to the impression that higher education is less successful in producing a skilled workforce that meets the needs of the market by employers (Othman et al., 2023). Moreover, the absence of statistically significant variations in employability issues according to gender implies that people of both genders in Johor's vocational education environment encounter comparable barriers to employment (Ismail et al., 2020). The workplace discrimination, skill mismatches, career counselling, and job possibilities may have an impact on vocational students of both genders (Galsanjigmed & Sekiguchi, 2023). It disproves the old gender stereotypes that say one gender is more suited for particular sectors or professions than the other.

The Malaysian Ministry of Education needs to be aware of the unemployment issue to prevent graduates from being dumped without job opportunities. The increasing number of students in

Malaysia does not align with the projected employment requirements, highlighting the need for better job opportunities and addressing the unemployment issue.

The suitability of study programs for careers

The study reveals that the compatibility of study programs with the careers of VC graduates in Johor state is high, based on gender, study program, and VC. However, the majority of graduates struggle to match their studies with their desired career, with the highest mean value being "my studies are useful to find a sufficient job after graduation. This is due to the belief that their hajj during VC does not contribute to their personality and personal development, causing employers to lose faith in VC graduates' ability to find work (Maulana et al., 2023). Experts also support the importance of enhancing interpersonal skills as a learning content in VC to increase students' self-confidence and give employers confidence in their graduates' competency skills. This highlights the need for VC to emphasize the importance of interpersonal skills in enhancing the career prospects of VC graduates (Jaafar et al., 2018).

Furthermore, the second highest challenge is "my studies are useful to fulfill my current professional duties" is KS6 "my studies are useful to fulfill my current professional duties". This is due to a lack of collaboration between VC institutions and industry employers in coordinating the skills and knowledge required by graduates. In 2005, the Malaysian government introduced the "TVET National Dual Training System" to establish close cooperation between industry and TVET institutions for the development of skills to meet the skilled workforce required by industrial employers in Malaysia (Rohiat et al., 2023). In Johor, the level of compatibility of studies with careers based on gender is higher for females than males, with 110 female graduates and 95 male graduates. This problem is complicated by rapid technological changes, making it difficult for individuals to adapt quickly (Hassan et al., 2020).

In Addition, on KS12, "I am studying at a college that uses the latest technology along with the development of the industry" has very high level of compatibility of studies with the careers of graduates who have worked in their respective fields in the state of Johor. This is because, graduates' capacity to use their knowledge and skills in the workplace is greatly impacted by their exposure to technology and high levels of self-efficacy (Maran et al., 2022). Graduates' skill sets are shaped by their exposure to technology, particularly in professions where having technological competence is valued. Graduates who have experienced cutting edge technology are better able to navigate contemporary workplaces and adjust to changing industry demands, which improves their employability and allows them to make valuable contributions to their professions (Asefer & Abidin, 2021). A strong belief in one's capacity to apply information and abilities is a sign of high self-efficacy, and this belief is a crucial factor in determining success in the job. Graduates that possess high self-efficacy are more likely to be innovative, proactive, and problem-solvers, which increases job satisfaction and opens up professional progression prospects (Li et al., 2022). This combination benefits individual career trajectories and the competitiveness of organisations by fostering a culture of innovation and continual learning. Thus, encouraging students' self-efficacy and giving technology integration in the classroom top priority would better equip graduates for success in the quickly changing job market of today (Idris et al., 2023).

Electrical Technology study programs have a high level of compatibility with careers challenge based on the study program, with 49 graduates compared to other study programs. Employers today choose graduates with competent and comprehensive skills to adapt to changes in innovation. VC Batu Pahat in Johor has the highest challenge of compatibility with careers based on VC, with 52 graduates due to the lack of close cooperation between institutions and industrial

employers in Malaysia. VC needs to be sensitive to industry demand to supply graduates with comprehensive skills and knowledge in the use of technology in the present (Indarta et al., 2021).

The skill level that employers require of VC graduates

The study reveals that employers require high levels of skills based on gender, study program, and VC. The majority of VC graduates disagree with the ability to work under pressure, as they lack strong physical, mental, and emotional readiness for changes in management and work systems. Employers today seek employees with various skills, adaptability to different sectors, and a willingness to learn throughout life.

Female graduates have higher skill requirements challenge than male graduates, with 106 female graduates and 94 male graduates at very high levels. This is due to the inability of graduates to efficiently organize work processes and make quick decisions. (Tushar & Sooraksa, 2023) states that employers need employees with "employability" skills in personality, appearance, self-confidence, good communication skills, and decision-making abilities. However, today's graduates are unable to implement these skills due to a lack of confidence from employers in the industry. Electric Technology program face challenges in meeting industrial demand due to less exposure to current technology related to the it's program. The inefficient TVET management contributes to this lack of skills (Finney, 2020). Academic certificates alone cannot guarantee a job, but adding value in appearance, extensive knowledge, and confidence in doing a job efficiently is essential.

Furthermore, to get students ready for the ever-evolving technological needs of the workplace, VCs must modify their curricula and teaching strategies. This entails incorporating cutting-edge technologies, encouraging project-based learning to develop critical thinking and problem-solving skills, providing flexible learning routes, and keeping educators abreast of technological developments (Davidescu et al., 2020; Haleem et al., 2022). Students can learn how to navigate the digital world by being taught the importance of using technology ethically and responsibly (Maspul, 2024). These steps give pupils the information, abilities, and moral outlook they need to thrive in the quickly changing technology environment of today.

5. Conclusion

The data analysis conducted in this study revealed significant variations in the challenge levels of career selection based on gender, while no significant differences were found in the challenge levels of matching study programs with careers, or the skill challenges required by employers based on gender. However, when considering study programs, there were no significant differences observed in the challenge levels of career selection, matching study programs with careers, or the skill challenges required by employers. Furthermore, there were differences in the challenges associated with career choice, study program suitability, and employer expectations across different Vocational Colleges.

Author contribution

Tee Tze Kiong conceptualizes the research and interprets research findings, while Mohamad Azim Nashraf Bin Zulkifli prepares the literature review, acts as a data collector, and performs statistical data processing.

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Conflict of interest

There are no competing interests for all authors.

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