Analyzing External Drivers of Early Education TVET Adoption in Malaysia: Implications for Vocational Education Policy and Practice

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DOI: https://dx.doi.org/10.47772/IJRISS.2025.910000792

Received: 02 November 2025; Accepted: 10 November 2025; Published: 24 November 2025

ABSTRACT

In most developed countries, Technical and Vocational Education and Training (TVET) system is considered as one of the key factors in promoting industrial growth through the development of a competent and skilled workforce. With the increasing importance of early education in preparing young learners for their future careers, TVET programs have gained attention for their potential to provide practical skills and knowledge to children at an early stage. This study aims to investigate the external factors that influence the adoption of Technical and Vocational Education and Training (TVET) in early education in Malaysia. Understanding external factors and their perceptions of TVET adoption is critical to designing effective educational strategies and facilitating their successful implementation. This study uses a quantitative survey as the research method. Higher education participants, parents and teachers in Malacca, Malaysia will be selected as the sample to participate in this study. The results of the study will provide insight into the factors that contribute to the acceptance or resistance to early education TVET in Malaysia. Thus, it is expected that this study will provide upcoming academic scholars with a reliable and accurate grasp of TVET early education. By understanding the external factors, policy makers can design targeted interventions and strategies to effectively promote the adoption of TVET programs.

Keywords: Vocational Education and Training (TVET), Educational Policy and Practice, Vocational Skills Development, Workforce Development and Training, Entrepreneurship and Digital Competence, Early Education and Child Development, Educational Research Methods, Socio-Economic Impact Studies

INTRODUCTION

TVET, which stands for Technical and Vocational Education and Training, was created to fulfill the rising demand for highly qualified professionals that possess a variety of advanced skills (Ruzita Md. Yusoff, et al., 2020). Since TVET can solve a range of issues, including poverty, unemployment, and the demand for employees with a variety of talents, it is presently attracting more attention than traditional higher education (Marope, P. T. M., 2022). Jane et al. claim that TVET is a sort of education that gives students the know-how and abilities they require to thrive in the labor market after graduation. The growth of TVET in Malaysia's educational system is consistent with the growth of TVET worldwide. Even while the labor market is improving, high rates of youth unemployment continue to be a major worry (Kaprawi, N., Rasi, et al., 2022). Recent studies also emphasize the role of digital competence and entrepreneurial orientation in shaping TVET students' entrepreneurial intention, which highlights TVET's potential to prepare job-ready graduates for the modern economy (Triyono et al., 2023).

Graduates had a higher rate of unemployment than those with secondary, primary, or no formal education, according to the Department of Statistics Malaysia and the Economic Review 2019 of the Ministry of Finance

Malaysia (Hanapi, Z. & Nordin, M. S., 2022). According to study, many graduates lacked the necessary knowledge, talents, and skills (Zaharah Che Isa & Nurulwahida Azid, 2021). Experts contend that one of the causes of this is that our graduates have not kept pace with the quick advancements in technology. To finalize the process of becoming a developed country, Malaysia needs top-tier human resources through TVET priority areas (Aizuddin Saari et al., 2021). However, many ASEAN nations' TVET programmes are of poor quality (Ating, M., 2022). Hence, this study is embarked to examine the external factors influencing the adoption of early education TVET in Malaysia.

In TVET higher education institutions, skill-based disciplines including technical and commercial services courses that have been modified to be in line with the national development plan are the focus of orientation. In Germany, where 60 to 70 percent of pupils opt to attend vocational schools, TVET is often recognized as one of the most useful components of the educational system. To strengthen education, particularly TVET, South Korea, Singapore, and China are all stepping up their efforts (Danial, J., and Mohamed, S., 2022). As a result, the Republic of Korea transformed quickly from a country ripped apart by war to a major economic force in the world (Mohd Jalil Ahmad et al., 2022). Similarly, the assessment of professional competencies in TVET programs, such as engine tune-up injection systems, is crucial for improving technical training outcomes and aligning with workforce needs (Nurtanto et al., 2020).

Malaysia must restructure its economy and reach its objective of being a developed nation, and this requires having human resources that are of high quality and capability. To prepare future workers for a market economy that was more diversified and dynamic, this form of training was undertaken (Sharifah Kamaliah et al., 2022). TVET is essential for a developing country like Malaysia to create the human capital required to become a developed country (Zoharah Omar et al., 2022). According to Zoharah et al., TVET can help those with low educational attainment to better access decent jobs and higher-paying positions, helping them escape poverty and social marginalization while also obtaining more social respect. Furthermore, addressing gaps in teacher competency standards in TVET can strengthen vocational education outcomes and support long-term economic goals (Estriyanto et al., 2017).

Technical and Vocational Education and Training (TVET) plays a vital role in developing a skilled and competent workforce to meet the growing demands of modern industries. In recent years, attention has expanded toward integrating TVET principles into early education, referred to as Early Education TVET, which focuses on introducing foundational vocational and technical skills to children aged approximately 5 to 12 years old. This approach aims to foster early awareness of practical skills, creativity, and problem-solving abilities while nurturing interest in technology and entrepreneurship from a young age. Early Education TVET emphasizes the development of digital, cognitive, and soft skills, equipping learners with essential competencies for lifelong learning and future employability. In Malaysia, the introduction of early TVET aligns with national goals to enhance human capital and strengthen workforce readiness in line with the Fourth Industrial Revolution (IR 4.0). However, challenges remain in achieving consistent adoption across schools and institutions. In this study, the term "adoption" refers to the acceptance, integration, and implementation of TVET concepts within early education systems through policy initiatives, curriculum adaptation, and parental support. Understanding these external factors particularly government policy, industry participation, and market demand is crucial for advancing Malaysia's educational agenda and fostering sustainable socio-economic growth (Korhonen et al., 2020).

Review of Related Studies

Recent studies on Technical and Vocational Education and Training (TVET) have increasingly emphasized its critical role in developing skilled human capital and supporting national economic transformation. In Malaysia, TVET has been recognized as a key driver of workforce readiness and employability, particularly in addressing skill mismatches between graduates and labor market demands (Karim & Mustapha, 2022). However, most existing studies focus on higher education and post-secondary levels, while limited attention has been given to early-stage TVET, especially within primary or foundational education. This creates a significant research gap in understanding how early vocational exposure can influence long-term skill development and career orientation.

Internationally, studies have explored TVET curriculum responsiveness and its alignment with labor market

needs. Cabreros (2023) that the success of TVET programs largely depends on how effectively they integrate current market skills and industry standards into the curriculum. Similarly, Triyono et al. (2023) highlighted that digital competence and entrepreneurial orientation are emerging as key learning outcomes in modern TVET, reflecting the growing importance of technological literacy in the workforce. While these studies provide valuable insights into curriculum design and skill readiness, they primarily address post-secondary TVET contexts and overlook the potential of early education in instilling foundational technical and problem-solving abilities.

Within the Malaysian context, Hasim et al. (2022) emphasized the role of "Higher TVET" in aligning national curricula with international standards but noted the lack of vertical integration from early to tertiary education. Furthermore, Zulkarnain and Yasin (2023) identified motivational and perception-based barriers that hinder student participation in TVET programs, suggesting that early exposure could help change negative societal attitudes toward vocational learning. Despite these contributions, empirical evidence on how external factors such as government policies, industry participation, and market demand affect the early adoption of TVET remains limited.

This study builds upon the existing literature by focusing on the external drivers influencing the adoption of Early Education TVET in Malaysia, an area that remains underexplored. By examining the interaction between policy initiatives, industrial collaboration, and market expectations, this research extends prior findings to a younger educational cohort. In doing so, it contributes a new dimension to TVET scholarship by proposing that early intervention can foster lifelong technical interest, reduce later skill mismatches, and strengthen Malaysia's human capital development in alignment with Industry 4.0 priorities.

Scope and Significance of Study

The scope of this study on the uptake of early education Technical and Vocational Education and Training (TVET) is to identify the outside forces that affect the uptake of such initiatives. The goal of the study is to provide light on the elements that help or impede the adoption of early education TVET and their effects on the promotion, acceptability, and success of these initiatives. The study will primarily examine the external factors related to government policy, industry participation and market demand. To comprehend the significance of these characteristics and the consequences for the acceptance of early education TVET, they will be examined within the Malaysian context.

To obtain information and insights into the outside variables impacting the adoption of early education TVET in Malaysia, the research would comprise a thorough literature review. It is crucial to highlight that this study does not include a thorough examination of internal elements found in educational institutions, such as the design of the curriculum, the qualifications of the teachers, or the motivations of the students. The fundamental goal of this study is to comprehend the external impacts on the adoption of early education TVET in Malaysia, even though these internal elements may interact with the external aspects.

The scope of the study is limited to the Malaysian context and does not extensively compare or contrast the adoption of early education TVET across different countries. However, to educate and improve the findings in the Malaysian context, it may be useful to rely on global trends and best practices. To help policymakers, educators, industry stakeholders, and parents make well-informed decisions, engage stakeholders, and develop strategies to promote and enhance the adoption and effectiveness of early education TVET programmes in Malaysia, this study's focus has been narrowed to the external factors influencing the adoption of early education TVET in Malaysia.

This study focuses on examining the external factors influencing the adoption of Early Education TVET in Malaysia. The research emphasizes how government policy, industry involvement, and market demand affect the acceptance and implementation of TVET programs at the early education level. The scope of the study is confined to the Malaysian context, particularly within the state of Malacca, which represents a diverse educational and socio-economic environment suitable for analyzing early adoption trends. The study defines "adoption" as the process by which educational institutions, policymakers, and parents accept and integrate TVET elements into early learning systems. It excludes internal institutional factors such as curriculum design or teacher qualifications to maintain focus on external influences. The significance of this research lies in its

potential to provide policymakers, educators, and industry stakeholders with evidence-based insights to strengthen collaboration, improve program effectiveness, and support Malaysia's national agenda for developing a future-ready, skilled generation. By identifying key external drivers, this study contributes to the broader understanding of how early vocational exposure can enhance students' preparedness for lifelong learning and employability.

LITERATURE REVIEW

Dependent Variable

In Malaysia, TVET is designed to increase skilled human capital via the delivery of high-quality instruction and training that is in line with market demands and offers resources for future study or entrepreneurial endeavors. The 11th Malaysian Development Plan 2016–2020 (11MP), which outlines the main drivers of the Malaysian TVET strategy, calls for strengthening lifelong learning for skill enhancement, transforming TVET to meet industry demand, and improving the educational system's quality for better student outcomes and institutional excellence.

TVET is an important factor in job placement since it meets the requirements of both individuals and businesses. TVET is a form of education that gets students ready for jobs that need a certain set of competences. The National Youth Skills Institute (IKBN) under the Ministry of Youth and Sports, Mara High Skills College (KKTM) under the Ministry of Urban and Regional Development, Community Colleges under the Ministry of Education Malaysia, and several other TVET providers under the Ministries of Education and Agriculture are among Malaysia's public TVET providers. Malaysia's Ministry of Education has categorized TVET institutes into two levels: basic and high. The centers for basic skills education (SMT) are the Technical High School and Vocational College. The government offers higher education facilities such polytechnics, community colleges, and public skills training organizations (ILKA).

The present situation of early education TVET in Malaysia is described in this section. The government's activities and strategies for encouraging young people to enroll in TVET programmes are covered in this article. Additionally, it looks at the value of early education TVET in bridging the skills gap in the workforce and preparing young students for future jobs. The section emphasizes the need for more investigation into external factors and early education TVET in Malaysia.

Independent Variable

This section explores the external factors that influence the adoption of TVET programs, specifically in the context of early education in Malaysia. It examines factors such as government policy, market demands and industry participation. The section reviews the relationship between these external factors influencing the adoption of early education TVET in Malaysia. Government policy, industry participation and market demand are important factors that influence the adoption of early education TVET in Malaysia.

Government Policy

Over the past few years, TVET has expanded throughout the organization (Tazifuzin et al., 2021). The current analysis emphasizes the critical role that TVET plays in the Malaysian economy, where the industrial sector accounts for 36% of the labour force and ranks as the second-largest contributor to GDP at 37.8%. TVET education and development in Malaysia has grown to include more than 500 institutions operated by several ministries since its beginning more than 40 years ago (Mohd Jalil Ahmad et al., 2022). A technologically sophisticated, internationally competitive, well-respected, and prosperous nation is what Malaysian TVET education aims to create.

In addition, the Malaysian government launched ACET 2015 with the creation of eight main goals designed to prepare the TVET sector to meet market needs and be able to address challenges of the twenty-first century. The Malaysian government is steadfastly committed to improving the TVET system throughout the nation. A significant progress was also demonstrated by mainstreaming TVET education and improving graduate study competency so that it is marketable in the Tenth Malaysia Plan (10MP) for the period of 2011-2015. The National Education Blueprint of Malaysia's Ministry of Higher Education places a strong emphasis on creating graduates

who are global, holistic, entrepreneurial, and lifelong learners (Hasim, A.S. et al, 2022). As a result, the strategy equalizes TVET courses at Malaysian technical institutions with ordinary engineering programmes by developing the "higher TVET" (HTVET) track.

To increase chances for Malaysians and reduce dependency on foreign labor, one million new employments had been created by 2020 (Kamin, Y., & Ahmad, A, 2022). The usage of TVET-related skills and productivity was required for more than half (60 percent) of the 1.5 million new roles, and as a result, salaries increased. Employers must hire much more skilled workers who can meet industry expectations based on current and future demands because of this trend (Viji Ramamuruthy et al., 2021). As part of the Twelve Malaysia Plan, the government has created a National Technical Education and Vocational Training Empowerment Agenda to aid in the development of skilled employees. Additionally, there has been a rise in business and academic cooperation and the creation of a single platform for TVET supply and demand.

Industry Participation

Even while industry participation in the TVET system is essential, getting their support is challenging because it's still unclear what advantages both sides may receive. To give students the essential industry experience through internships, apprenticeships, on-the-job training, and other programmes, every TVET center is eager to establish strategic collaborations with businesses. These activities are essential for helping students develop the physical and mental skills necessary to be job ready. However, there are a finite amount of mutually beneficial services that business may get from TVET institutions.

The On-the-Job Training (OJT) initiative for TVET students is now Malaysia's most significant industry contribution to addressing training centers' demands, notably for graduates from regional TVET institutions. Because they need considerable industrial involvement in the development and upgrading of their programmes for them to be marketable, their contributions fall short of what TVET institutions had hoped for. Due of the absence of mutual interest that TVET institutions may provide to potential industrial partners, the current industrial cooperation with TVET centers tends to be one-sided.

Market Demands

The unemployment rate among higher education graduates increased, from 17.43% in 2010 to 30.67% in 2014, according to the Department of Statistics Malaysia (DSM). Six months after they finished their studies, over 55,000 graduates were still without a job in 2016, according to the Higher Education Minister. From 2011 to 2015, the proportion of graduates without jobs stayed the same. According to the Ministry of Education's Graduate Trace report, graduates were having trouble finding employment six months after earning their degrees. According to the Ministry of Education's Graduate Tracer research, even a year after graduation, over 60% of graduates are still without a job. Employees are required to stay current on global economics due to the constantly shifting employment market and rapid technological advancement. As a result, it is crucial to make sure that graduates possess employability abilities that are highly desired by the present business.

The employability skills underlined in the MQF (Jamaludin et al., 2019) (Malaysian Qualifications Agency (MQA), 2017) are determined to be applicable to the present industry contexts, according to research by Jamaludin, Alias, DeWitt, Kenayathulla, and Abdul Razzaq. Employers from a variety of industries priorities fundamental abilities, thinking skills, personal traits, workplace competencies, and entrepreneurial skills, according to practically all the studies that were chosen. The success of a nation's socioeconomic growth depends heavily on the availability of skilled human resources that have been prepared in accordance with market demand. In addition to having a crucial part in the development of the individual, the technical and vocational education and training (TVET) sector is widely regarded as being crucial for national development worldwide.

Theoretical Framework

This study is grounded in three key theoretical perspectives that collectively explain the factors influencing the adoption of early education Technical and Vocational Education and Training (TVET) in Malaysia the Diffusion of Innovation Theory, the Human Capital Theory, and the Stakeholder Theory.

The Diffusion of Innovation Theory developed by Rogers (2003) provides the foundation for understanding how new educational practices, such as early education TVET, are introduced and adopted within a social system. According to this theory, innovation adoption depends on factors such as perceived benefits, compatibility with existing values, simplicity, and observability. In the context of this study, the theory helps explain how schools, educators, and parents decide to adopt early TVET programs when they perceive clear advantages in improving children's skill development and employability potential. Government communication policies and media exposure also act as external "drivers" that accelerate diffusion across educational institutions.

The Human Capital Theory supports the notion that education and training are crucial investments that enhance individuals' productivity and contribute to national economic growth. This theory emphasizes that early exposure to vocational and technical skills builds the foundation for lifelong learning and skill acquisition, which are vital in preparing Malaysia's future workforce. Early Education TVET contributes to human capital formation by equipping learners with practical, digital, and cognitive competencies aligned with future job demands. This aligns with Malaysia's broader agenda to enhance employability and reduce youth unemployment through skill-based education pathways.

Finally, the Stakeholder Theory emphasizes that effective educational implementation requires collaboration among multiple actors—government agencies, industry partners, educators, and parents. In the context of this study, stakeholder involvement is central to understanding how external support systems influence the adoption of early education TVET. Industry partnerships ensure curriculum relevance, government policies provide structural support, and parental attitudes influence acceptance at the community level. Together, these stakeholders shape the ecosystem necessary for successful adoption and sustainability of TVET initiatives at the early education stage.

By integrating these three theories, this study establishes a comprehensive framework that links innovation diffusion, human capital development, and stakeholder collaboration. This theoretical foundation supports the analysis of external factors affecting the adoption of early education TVET and offers valuable insights for policy formulation, educational reform, and industry engagement.

Research Design

The research design outlines the framework used to address the research objectives and guide the overall process of data collection and analysis. This study adopted an explanatory quantitative research design, which was appropriate for examining the relationship between external factors and the adoption of early education TVET in Malaysia. A stratified random sampling method was employed to ensure that participants were proportionally represented across key groups, including higher education participants, teachers, and parents. This approach improved representativeness and minimized sampling bias. The data collection instrument was a structured questionnaire, which underwent pilot testing to ensure clarity and reliability. The internal consistency of the instrument was verified using Cronbach's alpha, achieving values above 0.70, indicating acceptable reliability. Content validation was carried out by subject-matter experts in TVET and educational research. This design allowed for a systematic exploration of the correlation between government policy, industry participation, and market demand in influencing early education TVET adoption, providing a reliable foundation for empirical interpretation and policy recommendations.

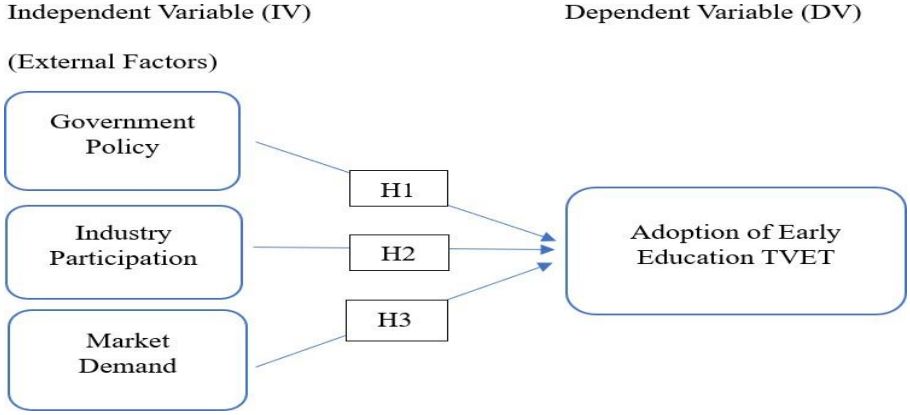

Figure 1: The Research Model in This Study

FINDINGS AND OBSERVATIONS

Demographic Analysis

Based on Figure 2, the pie chart shows the frequency and percentage of respondents' gender. There were 85 female respondents out of 57% of the 150 respondents. In comparison, 43% of the 150 respondents were 65 male respondents. Based on these results of Microsoft Form, the researcher can conclude that there are more female respondents than male respondents in this research.

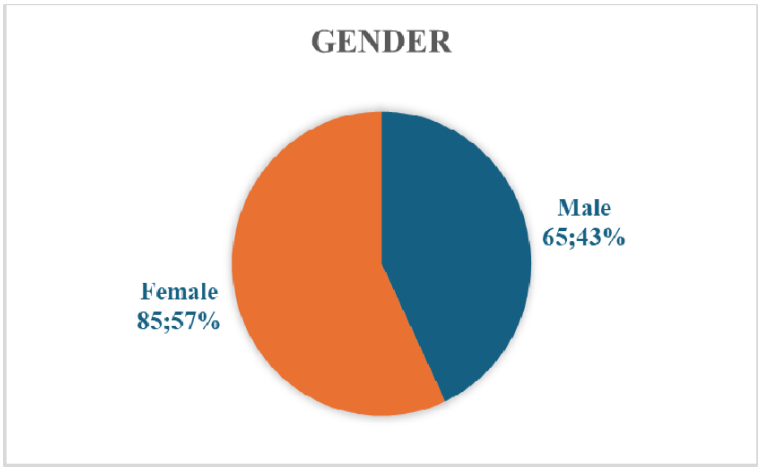

Figure 2: Gender of Respondent

Based on Figure 3, the pie chart shows the frequency and percentage of respondents' ages. The highest percentage among the respondents is 37%, representing 55 respondents from 18 to 24 years old. The second highest percentage is 27% representing 40 respondents from 25 to 34 years old. The third highest percentage is 21% representing 32 respondents from 35 to 44 years old. The fourth highest percentage is 11% representing 17 respondents from 45 to 54 years old. The lowest percentage is 4% representing 6 respondents from 55 years old and above. The researchers set the age at 18 and above because it is believed that this age group has reached a certain level of cognitive maturity and life experience. Respondents in this age group are more likely to form their own opinions about education, career aspirations and the relevance of vocational training to their lives.

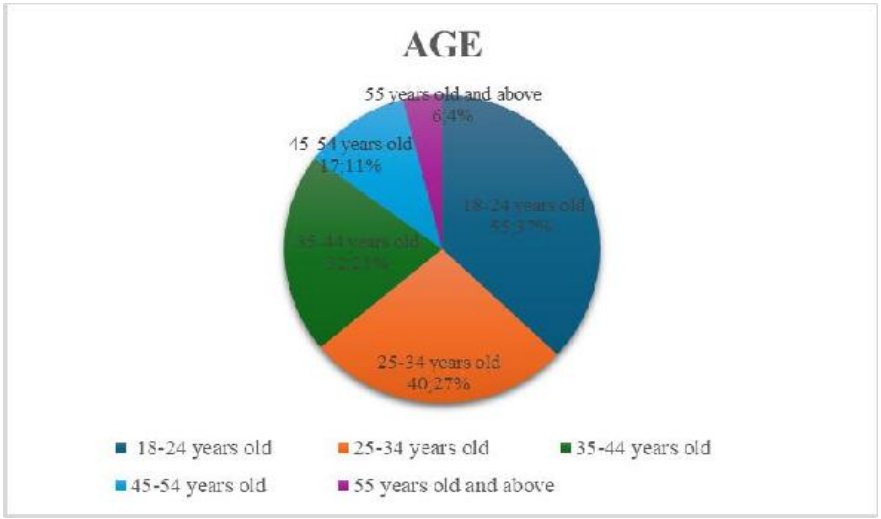

Figure 3: Age of Respondents

Based on Figure 4, the pie chart shows the frequency and percentage of respondents' ethnicity. In this study, most of the respondents were Malay including 86 respondents (57%). Next, 47 out of 150 respondents were Chinese respondents (31%). Then comes Indian respondents with 10% (15 respondents). Finally, the lowest category represents other respondents with 1% (2 respondents). Understanding the racial and ethnic composition of the respondents contributes to the study's commitment to diversity and inclusion. This information helps

ensure that the study captures a representative sample of the population and understands the perspectives of individuals from diverse racial and ethnic backgrounds.

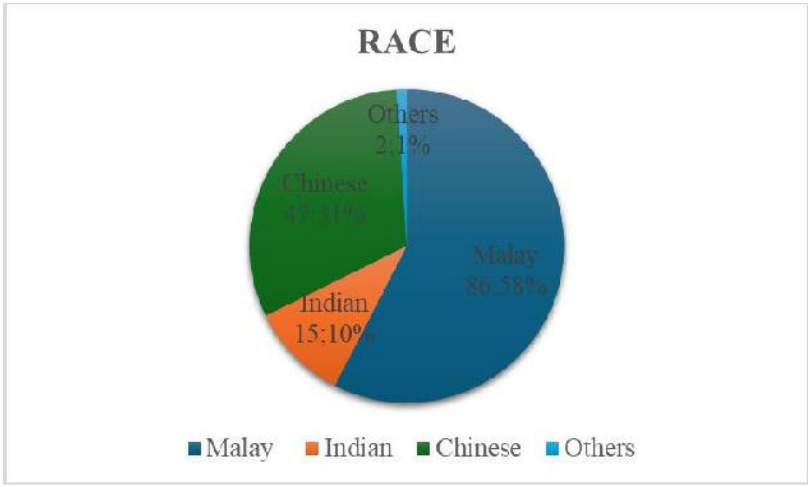

Figure 4: Race of Respondents

Figure 5 shows that the marital status of most of the respondents was single a total of 75 (50%). Secondly, 46% were married, comprising 69 persons. Lastly, the percentage and frequency of divorced and widowed people is the same as the number of people, which is 2% and 3 people. Marital status is an important component of an individual's socio-demographic characteristics. Knowing the marital status of respondents can provide contextual information about their life stage, their responsibilities, and their potential perspectives on education, especially when the study involves adult learners or parents making decisions about their children's education.

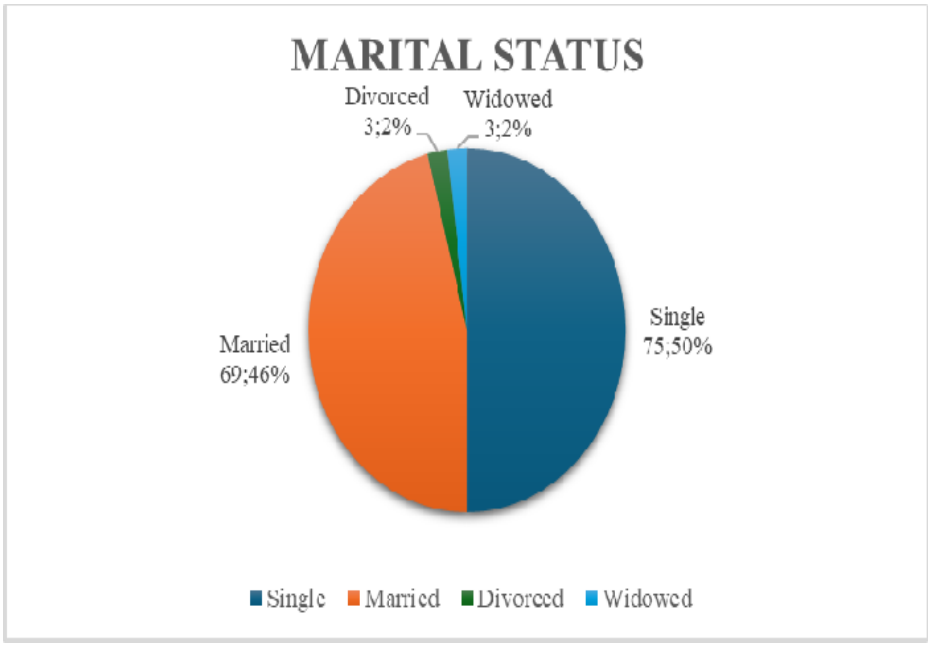

Figure 5: Marial Status of Respondents

Based on Figure 6, the highest number of respondents were higher education participants, with a total of 64 higher education participants (43%) answering this questionnaire. Secondly, a total of 63 parents answered this questionnaire out of 150 respondents, accounting for 42%. Finally, a total of 23 teachers (15%) answered the questionnaire. The researcher restricted the respondents to higher education participants, parents, and teachers. This is to ensure that respondents are directly exposed to or involved in educational settings, particularly TVET settings. These groups are likely to have first-hand experiences, views and insights relevant to the adoption of TVET in early years education.

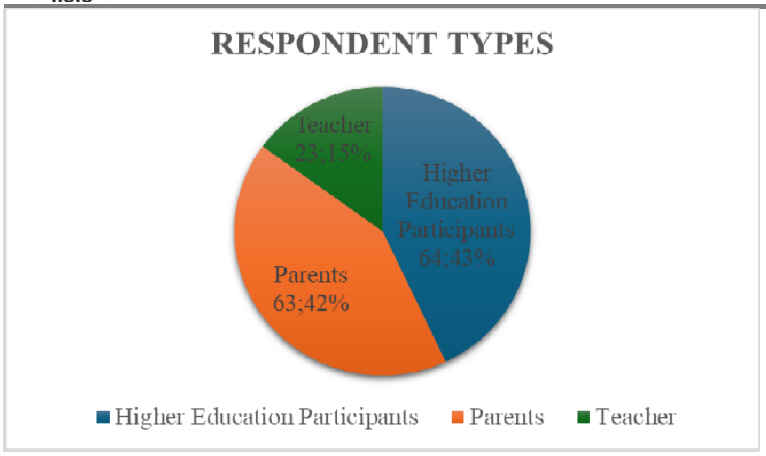

Figure 6: Respondent Types

According to the Figure 7, the respondents whose occupation is employment are the highest. A total of 96 people filled out the questionnaire, accounting for 64%. The second highest number is unemployment, with 33 people (22%). The third highest number was housewives, with 11 people (7%) answering the questionnaire. Finally, a total of 10 people whose occupation was other respondents answered the questionnaire. Understanding respondents' occupations can help researchers explore the relationship between an individual's current employment status or role and their choices about early education and vocational training.

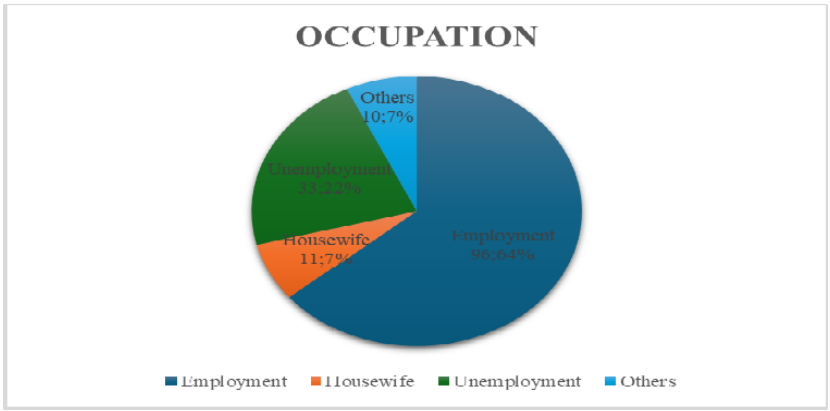

Figure 7: Occupation of Respondents

According to the Figure 8, 136 out of 150 respondents know what TVET is, accounting for 91%. Then, 14 people, accounting for 9%, do not know what TVET is. This question helped the researcher to measure the respondents' basic knowledge of TVET. Once there is a lack of knowledge among the respondents, the researcher needs to communicate this to promote understanding.

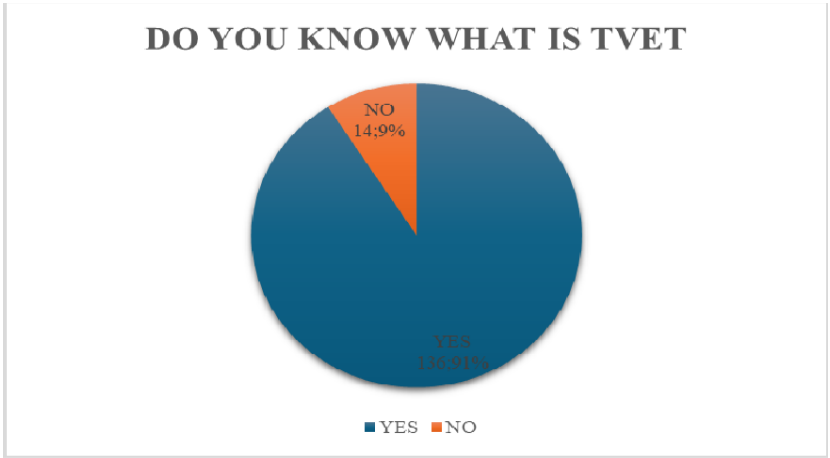

Figure 8: Do you know what TVET is

Pearson's correlation analysis

Pearson's correlation analysis is an accurate quantitative method for determining the strength of the linear correlation between groups of continuous variables used in this study. The linear relationship between independent variable and dependent variable can be demonstrated by the proximity of the relationship to an exact straight line. Also, the direction of the linear relationship can be seen as a pattern of their increase or decrease.

Table 1: Pearson Correlation Analysis

Variable	Government Policy	Industry Participation	Market Demand	Adoption of Early Education TVET	Sig. (2-tailed)	N
Government Policy	1	0.655	0.637	0.629	< .001	150
Industry Participation	0.655	1	0.783	0.768	< .001	150
Market Demand	0.637	0.783	1	0.755	< .001	150
Adoption of Early Education TVET	0.629	0.768	0.755	1	< .001	150

Table 1 shows the statistical significance of the relationship between the independent variables and early education TVET adoption. First, government policy has considerable predictive power of p<.001, r=0.629, n=150, which means that it is a strong indicator of early education TVET adoption. Second, industry participation has a significant value of p<.001, r=0.768, n=150, indicating that it is one of the significant predictors of early education TVET adoption. In addition, the significant value of p<.001, r=0.755, n=150 for market demand indicates that it significantly influences early education TVET adoption.

Regression Analysis

According to Sykes (1993), regression analysis is a mathematical tool used to examine the correlation between dependent and independent variables. Researchers can use this type of analysis to determine the causal relationship between a variable and other variable. The method chosen for this survey is linear regression analysis.

Table 2: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	0.814	0.662	0.655	0.44698	0.662	95.48	3	146	< .001

According to the Table 2, the r value is 0.814, which means that there is a relationship between the dependent variables and independent variables. Next, the r-squared value is 0.662, which means that the three independent variables account for 0.662 of the variation in the dependent variable. This could also explain that there is a 62% variance in the adoption rate of TVET Early Education, which could be influenced by factors such as government policies, industry participation, and market demand.

Table 3. Regression Coefficients Predicting Early Education TVET Adoption

Predictor	Unstandardized B	Std. Error	Standardized Beta (Î²)	t	Sig. (p)	95% CI (Lower)	95% CI (Upper)
(Constant)	0.512	0.081	-	6.32	< .001	0.353	0.671

Government Policy	0.286	0.052	0.289	5.5	< .001	0.184	0.388
Industry Participation	0.374	0.049	0.425	7.63	< .001	0.277	0.471
Market Demand	0.298	0.051	0.361	6.12	< .001	0.201	0.395

Table 3 presents the regression coefficients for the predictors of early education TVET adoption in Malaysia. The results indicate that all three independent variables government policy, industry participation, and market demand significantly and positively influence the adoption of early education TVET programs. The constant value ($B = 0.512$, $p < .001$) represents the baseline level of adoption when all other predictors are held constant. Government policy ($B = 0.286$, $\beta = 0.289$, $p < .001$) shows a significant positive effect, suggesting that stronger policy support and government initiatives contribute to greater adoption of TVET in early education. Industry participation ($B = 0.374$, $\beta = 0.425$, $p < .001$) has the strongest influence among the predictors, indicating that active collaboration between industries and educational institutions plays a crucial role in promoting TVET programs.

Market demand ($B = 0.298$, $\beta = 0.361$, $p < .001$) also contributes positively, meaning that as labor market needs for skilled workers increase, the adoption of early education TVET becomes more likely. The t-values, which range from 5.5 to 7.63, further confirm that all predictors significantly contribute to the model, and the 95% confidence intervals do not cross zero, reinforcing the reliability of these results. Overall, the findings suggest that effective policy implementation, strong industry engagement, and growing market needs collectively enhance the adoption and success of early education TVET in Malaysia.

DISCUSSION

The first objective of this study is to identify the level of government policies influence mass choice the adoption of early education TVET in Malaysia. For this purpose, Pearson correlation analysis was used and the results are presented in Table 4.5. In this study, the p-value of government policy information is p=0.32, which is lower than 0.05, and the t-value is 2.169, which is higher than 1.96. Therefore, H1 is accepted. There is a significant positive correlation between government policies and adoption of early education TVET. The results of this study are supported by earlier investigations. According to Zetti et al. (2023), government support for information dissemination can have a significant impact on TVET programs. Then, according to Zetty et al. (2023) also, government communication policies can increase public awareness of TVET.

The second objective of this study is to examine the level of industry participation in shaping the adoption of early education TVET in Malaysia. From Table 4.5, it shows that the p-value of government policy information is p<0.001, which is lower than 0.05, and the t-value is 4.897, which is higher than 1.96. Therefore, H2 is accepted. There is a significant positive correlation between industry participation and early education TVET adoption. These results are consistent with an earlier study by Sohimi et al. (2022). Industry participation enables TVET institutions to overcome the skill gap between TVET institutions and industry and produce competent graduates for their respective fields. The need for knowledge sharing between research institutions and industry is becoming increasingly evident. These institutions also need to be motivated to collaborate with industry to improve teaching and learning, access funding, enhance reputation, and gain access to industry experience data (Sohimi et al., 2019).

The third objective of this study was to examine the level of the role of market demand in shaping the adoption of early education TVET in Malaysia. Table 4.5 shows that the p-value of government policy information is p<0.001, which is lower than 0.05, and the t-value is 4.380, which is higher than 1.96. Therefore, H3 is accepted. There is a significant positive correlation between market demand and adoption of TVET in early education. These results are consistent with Stephen's earlier study (2023). TVET positively impacts productive graduates with skills needed for labor market demand. TVET theory education and training that students should be familiar with can only have a positive and significant effect on producing good graduates if labor market information is incorporated into the system. According to Yadessa et al. (2021), it is stated that labor market needs should be

the primary focus of TVET. TVET is important for the development of a skilled workforce that meets the needs of the labor market.

RECOMMENDATIONS

This study highlights the significant influence of government policy, industry participation, and market demand on the adoption of early education TVET in Malaysia. Based on the findings, several recommendations are proposed to strengthen future initiatives and enhance early TVET implementation.

From a policy perspective, the government should align early education curricula with national TVET standards to ensure coherence across all educational levels. Policies should prioritize early exposure to technical and vocational skills while integrating 21st-century competencies such as digital literacy, creativity, and problem-solving. In addition, sustainable funding models should be developed to support infrastructure, teacher training, and learning materials for early TVET programs. These efforts would help bridge policy gaps between early education and secondary-level vocational training.

In terms of implementation strategies, stronger collaboration between educational institutions and industries is crucial. Schools and local industries can establish partnerships through apprenticeship programs, project-based learning, and short-term skill workshops for children. Such initiatives would help young learners connect theoretical knowledge with real-world applications and foster early interest in technical fields. Furthermore, periodic monitoring and evaluation mechanisms should be introduced to ensure that implementation aligns with policy objectives and responds to emerging labor market needs.

For stakeholder-specific engagement, educators should receive continuous professional development to integrate TVET-based learning methods into their teaching practices. Parents should be actively involved through awareness campaigns that highlight the long-term benefits of vocational education and dispel misconceptions that TVET is only for low academic achievers. Curriculum developers should collaborate with industry experts to design age-appropriate, hands-on learning modules that reflect real industry practices. Finally, policymakers and researchers should work together to create a national framework for early education TVET that is inclusive, practical, and responsive to Malaysia's socio-economic goals.

By combining policy alignment, strategic collaboration, and stakeholder engagement, Malaysia can enhance the adoption and sustainability of early education TVET. These recommendations aim to prepare a future generation of learners who are skilled, adaptable, and ready to meet the demands of a rapidly changing global economy.

CONCLUSION

This study aimed to examine the external factors influencing the adoption of early education TVET in Malaysia, focusing on government policy, industry participation, and market demand. The analysis, based on responses from 150 participants in Malacca, revealed that all three factors significantly and positively influenced TVET adoption. These findings highlight the importance of aligning educational policy, industrial collaboration, and labor market needs to support early vocational training initiatives. Although the current study provides valuable insights, future research with a larger and more geographically diverse sample would help validate and strengthen the findings. Overall, the study contributes to understanding how external forces drive the adoption of early education TVET and offers practical implications for policymakers and educators aiming to strengthen Malaysia's human capital development.

ACKNOWLEDGMENT

This publication was supported by University Technical Malaysia Melaka (UTeM) under the Journal Publication Fee Initiative 2025. The authors would also like to acknowledge the support from the Faculty of Technology Management and Technopreneurship

Conflict of Interest

Authors declare that there is no conflict of interests regarding the publication of the paper.

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