

TVET Reforms and Outcomes in Malaysia and Korea (2010-2025)

Ulaيمي Yahya¹, Hooi Peng Lim^{2*}, Muhammad Mustapha²

¹Deputy Director-General (Planning) Office, Department of Polytechnic and Community College Education 62100, Putrajaya, Malaysia

²Department of Mechanical Engineering, Politeknik Ibrahim Sultan, KM 10 Jalan Kong Kong, 81700 Pasir Gudang, Johor, Malaysia

*Corresponding author: limhooipeng@pis.edu.my

Please provide an **official organisation email** of the corresponding author

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Abstract

The Technical and Vocational Education and Training (TVET) systems in Malaysia and Korea have transformed in response to the demands of the global economy, industrial growth, and educational policy reforms from 2010 to 2025. This study aims to review how TVET reforms in four key fields, including the development of curriculum, performance of students, engagement of industry, and global standards' compliance in these two countries. Malaysia has spent significant financial resources to safeguard its TVET programs in line with its national economic policies through the Eleventh and Twelfth Malaysia Plans. The importance of technical skills in securing a job placement and the essence of lifelong learning are outlined in the Malaysia Education Blueprint 2013–2025. Whilst Korea modernises its TVET system through the implementation of the Meister High Schools and the Work-Learning Dual System. Young people are believed to be able to more easily secure jobs and adapt to a technology-driven industry through this shift in the TVET system. As a result of the TVET reforms, both countries have advanced TVET education through different approaches. Malaysia focuses on inclusion and capacity development, whereas Korea prioritises elevating industrial integration and competitiveness. To comply with the international standards established by organisations such as the United Nations Educational, Scientific and Cultural Organisation (UNESCO), the UNEVOC Network (UNESCO-UNEVOC), and the Organisation for Economic Co-operation and Development (OECD), academic institutions in Malaysia and Korea have developed strong collaborations with their local industry partners. The challenges never cease when it comes to the concerns of the community perceptions of TVET and unbiased access to these educational opportunities, despite having improvements in student learning outcomes, for example, the job placements and technical skills in both countries. Therefore, this review article recommends several approaches to overcome the aforementioned challenges, including opportunities for collaboration, the integration of digital transformation into TVET, and the incorporation of policies to achieve the objectives associated with Industry Revolution 4.0. The results are intended as guidance for all stakeholders to improve the versatility and efficacy of TVET systems in Malaysia and Korea.

Keywords: - *Reforms in TVET, development of curriculum, industry collaboration, graduate employability, industry revolution 4.0 and transformation in digital*

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1. Introduction

Technical and Vocational Education and Training (TVET) has become an important part of national plans to boost economic growth and promote social inclusion. It is important to teach people not only social skills, but also

technical skills. This is even more true now that the Fourth Industrial Revolution (IR4.0) is underway and rapidly changing the world. In this situation, both Malaysia and Korea have made big changes to their TVET systems.

Malaysia is a developing country with a high-middle-income economy. It sees TVET as a key way to reduce youth unemployment, reduce economic and social

inequalities, and develop talent in line with plans such as the Shared Prosperity Vision 2030. On the other hand, Korea is a high-income member of the OECD and a world leader in technology. It has improved its existing TVET system to align with an advanced economy characterised by high-tech manufacturing, digital innovation, and complex service sectors. Despite the integration of TVET into the educational and economic systems, the diversity in governance decision-making, economic aims, and historical development remains a growing concern.

Studies of TVET systems in Malaysia and Korea show how countries adapt their education systems to meet their own needs while still meeting international standards (Chear & Arifin, 2024; Viktoria & Eunah, 2012 & Rahim, 2011). Malaysia works hard to engage more stakeholders and build connections with industries. Korea has a centralised, performance-based system that ensures schools meet industry needs. Even though these two views differ, they both agree that TVET is important for building human capital, making the younger generation more employable, and making the country more competitive.

This review article examines four significant domains: curriculum development, assessment of student achievement, collaboration with industry, and the establishment of global standards. The main goal of this review is to compare how TVET has changed in Malaysia and Korea from 2010 to 2025 in detail.

2. Methodology and Scope

This review article utilises a qualitative and document-centric comparative analysis methodology. Primary sources include national education policies, strategic plans, reports from international organisations such as UNESCO-UNEVOC and the OECD, and academic papers. The review covers the period from 2010 to 2025, including Malaysia's Education Blueprint 2013–2025, the Eleventh and Twelfth Malaysia Plans, Korea's creation of Meister High Schools, and improvements in digital and Industry 4.0 technologies. It also studies how the COVID-19 pandemic changed the education system and how those changes affected TVET delivery and policies.

3. Technical and Vocational Education and Training (TVET) in Malaysia from 2010 to 2025

3.1 Progress in the Curriculum's Development

From 2010 to 2025, the TVET curriculum in Malaysia underwent significant changes. This change shows that the country needs to keep up with changes in the economy, technology, and the way education is done around the world.

The Malaysia Education Blueprint 2013–2025 for Higher Education represents a substantial advancement in educational policy and reform (Malaysia, 2013). This project systematically incorporated TVET into higher education, highlighting the importance of employability,

technical competencies, and lifelong learning. The implementation of outcome-based education (OBE) represents a response to global trends aimed at improving curriculum development. The importance of establishing a curriculum that meets the demands of industry has been outlined in the Eleventh and Twelfth Malaysia Plans (2016–2020 and 2021–2025). The plans are to ensure that the on-the-job training programs are timely.

A shift to the competency-based module is essential to help students plan their own educational paths; for example, they can transfer credits between institutions and apply what they've learned. The Malaysian Qualifications Agency (MQA) has tried to refine its accreditation to encompass both academic and vocational qualifications in accordance with the Malaysian Qualifications Framework (MQF).

Several studies have reported that TVET institutions in Malaysia started to integrate immersive technologies such as artificial intelligence (AI), internet of things (IoT), Augmented Reality (AR) and Virtual Reality (VR), advanced manufacturing, and sustainable technology into their curriculum (Hamid et al., 2024; Razak et al., 2022; Kamis et al., 2017 & Zolkifli et al., 2016). Industry4WRD (National Policy on Industry 4.0) and the TVET IR4.0 are master plans designed to support academia in sustaining their skills in these growing areas through structured curriculum frameworks.

During the COVID-19 pandemic (between 2020 and 2022), there was a significant increase in the adoption of blended and online learning approaches. Virtual classroom, online assessments, and practical simulations have been widely used in open learning platforms. Hashim & Hamidon (2022) reported that student effectiveness and engagement increased significantly in TVET institutions through blended learning, which integrates online and in-person approaches. The advancement in digital platform usage is also attributed to government initiatives to provide Digital Teaching and Learning infrastructure support at TVET campuses.

3.2 Student Outcomes: Readiness for Work and Skill Development

It has been reported that the number of students in TVET increased from 200,000 in 2010 to 350,000 in 2023. Despite the provision of scholarship programs, improvements in curriculum design and retention strategies also contributed to the rise in graduation rates.

In 2010, the employability rate for TVET graduates was reported as 70%, based on data from the Ministry of Education. The number of graduates has increased to over 85% in 2022, showing a significant raise. The synergy in the areas of technical expertise, communication and teamwork, competencies in digital technologies and the adaptability to the current industry trends has been found to contribute to the increased of employability rate among the graduates (Mohmed et al., 2024; Awodiji & Magogodi, 2023 & Amin et al., 2023). As a result, employers are content with TVET graduates, as they can demonstrate their competencies across diverse fields such as skilled and

technical maintenance, digital services, and renewable energy.

Industry stakeholders are often satisfied with professional certification initiatives, such as the National Dual Training System (NDTS) and TVET Recognition of Prior Learning (RPL), which have facilitated graduates' seamless integration into industry needs. Lifelong learning enhancement, which is frequently in collaboration with the industry, has also contributed to the continuous professional development (Yunus et al., 2024; Amran et al., 2020 & Ashari & Rasul, 2014).

3.3 Collaborations with Industry and Practical Learning

The MTVET Council, which integrated 12 ministries, industrial councils, and educational bodies, was founded in 2021 to coordinate the TVET policies and plans. The role of the MTVET Council is to advise employer-driven curriculum development and enhanced industry involvement, to mitigate skill and job mismatches.

Inspired by the German and Swiss ideal of workplace learning efficacy, the National Dual Training System (NDTS) has been designed to collaborate with institutions such as the Institute of Technical Education and enterprises to provide organised workplace learning. The ideal learning framework generally consists of three days per week in authentic industry environments.

The HRD Corp (previously PSMB) is Malaysia's leading retraining initiative. It distributes grants and co-funding to complement worker skills in partnership with industries. Siemens, Panasonic, Toyota, and Petronas are part of the collaborations with international corporations to refine courses and facilitate access to advanced technological.

3.4 Global Benchmarking and Quality Assurance

To guarantee the quality of the Malaysian certification and earn recognition from global professional bodies, MQA-aligned TVET programs are often subject to rigorous audits, which also include worldwide benchmarking with organisations such as the ASEAN University Network (AUN) and validation by UNESCO-UNEVOC (Subrahmanyam, 2020 & Johnson, 2017).

Student mobility programs with other countries, such as Germany, Australia, Canada, and Korea, offer credit transfers and significant international experience. For example, Malaysian graduates earn merit and globally recognised credentials through collaborations with German-Chinese technical partners and dual certification programs.

3.5 Adjustment to COVID-19

Malaysian TVET universities rapidly transitioned to remote and hybrid learning modes from 2020 to 2022 due to the pandemic outbreak. Practical training has been replaced with online simulators, home-lab kits, and hybrid internships. The situation displayed the need for an adjustable curriculum design. It has led to the development of necessity-response frameworks for subsequent

interruptions (Ibrahim et al., 2022; Masrom et al., 2022 & Yeap et al., 2021).

4. TVET in Korea (2010–2025)

4.1 Curriculum Design and Innovation

In 2010, Korea introduced Meister High Schools, modelled after Germany's vocational system. These schools are designed to strengthen the status of vocational education and ensure training is closely aligned with industry demands. These schools, beginning with 21 institutions and expanding to over 52 by 2020, focus on fields such as semiconductors, robotics, and artificial intelligence (Yu et al., 2020). Students engage in two years of theoretical learning followed by one year of practical training. Exceptionally, more than 90% of Meister graduates successfully secure job offers before graduation.

Each Meister school has been given the autonomy to design a curriculum that customises programs according to local industry requirements. Besides, they receive support from the government, including complimentary tuition, accommodation, school infrastructure, and financial assistance.

Korea has implemented its National Competency Standards (NCS) since 2014. The NCS integrates the curriculum with industry competencies monitored by the Korea Skills Quality Authority. However, the implementation has encountered several constraints and obstacles, including financing deficiencies and the need for instructor retraining (Seung-hwan, 2021; Kim et al., 2019 & Kim & Jung, 2010).

Korea introduced a Work-Learning Dual System in 2013-2014, which accommodates formal education with practical training (Chai & Kim, 2020 & Chai et al., 2018). Supported by the government, apprentices can earn compensation and make significant contributions to the organisations (Kang & Song, 2024).

To meet evolving, timely skill requirements, education and lifelong learning programs for adults have been enhanced. The OECD report fostered appreciable governance and digital integration in adult education (Bo, 2025). Notwithstanding exceptional educational outcomes, concerns persist about overqualification and skill gaps, particularly in digital, communication, and problem-solving competencies.

4.2 Student Outcomes: Employment and Proficiency

By 2013, Meister graduates had remarkable employment rates, exceeding 90%. Several studies reported that the graduates experienced job satisfaction and improved alignment between their talents and job responsibilities (Park & Yu, 2023 & Lee et al., 2016).

Despite increasing employment rates, many individuals remain overqualified for their current positions. According to 2021 OECD data, 31% of Korean workers encounter this problem, frequently attributed to a deficiency in essential technology and communication skills (OECD, 2021). In

contrast to other nations, Korean workers do not face substantial wage penalties for overqualification.

4.3 Industry Collaborations and Governance

Korea's TVET is predominantly state-driven while increasingly aligned with market demands. Since the late 1990s, sectoral skills councils and labour market projections have been engaged to create industry-driven programs. It is important to strengthen alignment between skills development systems and youth employment policies to promote youth employability outcomes (Choi, 2014).

Each Meister school engages in close collaboration with industry strategic partners. This has brought an impact on student selection, curriculum development, internships, resources, and recruitment.

Companies offer training and salaries through the Dual System Financing and Incentives System, while the government provides financial support for the theoretical components of education. Apprentices receive remuneration, while companies receive subsidies through Korea's Employment Insurance System.

Kim (2024) reported that the OECD advocates for enhanced coordination among governmental tiers and greater stakeholder involvement to refine adult education governance. This is particularly for disadvantaged populations.

4.4 Global Benchmarking and Quality Assurance

Korea's national qualification framework is progressively aligning with international standards. Its TVET quality assurance system ensures the credibility of qualifications through standardised frameworks, industry collaboration and continuous evaluation aligned with current industry needs (Cho, 2016).

Korean TVET students have earned applause at international skills competitions, thereby enhancing the public perception of vocational education, especially among Meister alumni.

The OECD studies commend Korean student performance and highlight the need to place greater emphasis on upskilling adults to address rising inequalities.

4.5 The Impact of COVID-19 on Digital Transformation

Korea has emerged as a leader in online and hybrid education for adults since 2020. There are seen to have increasing challenges in ensuring equitable digital access for older adults and learners with limited skills. Several effective TVET policies and plans regarding pandemic outbreaks have been raised. This includes the adoption of digital learning, flexible training systems, and reskilling initiatives to maintain workforce readiness (Choi et al., 2020). It is recommended that there be action on cohesive governance structures and an increase in financial support for education initiatives, especially for adults.

A comprehensive comparison of Technical and Vocational Education and Training (TVET) reforms in

Malaysia and Korea between 2010 and 2025 is shown in Table 1.0. It highlights the transition and development of the curriculum, student outcomes, industry engagement (such as Industry Revolution 4.0), compliance with global standards, and the impact of the COVID-19 pandemic in these two countries.

5. Future Prospects in TVET Malaysia–Korea

Malaysia and Korea share common drivers, such as immersive digital transformation, shifts in demographic patterns, aspirations for a sustainable economy, and the pursuit of global competitiveness in the period following 2025. The progress made between 2010 and 2025 lays effective groundwork; however, the new challenges that have emerged demand innovative strategies, improved partnerships, and international cooperation.

5.1 Curriculum for the Future: Industry 5.0, Sustainability, and Digital Natives

In addition to Industry Revolution 4.0, Malaysia and Korea must prepare for Industry Revolution 5.0, which emphasises sustainability, human-machine collaboration, and resilience. The Industry4WRD plan of Malaysia and Korea's Digital Government Master Plan establishes a foundation for integrating green manufacturing and regenerative technologies. Future courses ought to consist of (1) human-centred automation and ethical considerations, (2) analysis of carbon footprint, circular economy, and renewable energy, and (3) interdisciplinary design thinking for social impact and innovation.

Leveraging existing blended learning, Malaysia's eTVET and Korea's digital infrastructure might implement AR/VR training and AI-driven adaptive learning systems. These tools would customise education, particularly for remote or rural pupils, and enhance resource allocation.

The modular approach of Malaysia's and Korea's National Competency Standards could be integrated through micro-credential frameworks, providing industry-recognised qualifications that address the changing demands of the workforce.

Collaborations between Malaysian TVET colleges and Korean Meister High Schools or the Department of Polytechnic and Community College Education could help establish joint Centres of Excellence in areas such as robotics, digital agriculture, or sustainable building. The proposed centres would collaborate to enhance infrastructure, develop new curricula, and recruit highly qualified instructors, thereby facilitating students' pursuit of dual degrees.

Table 1: Comparative analysis of TVET reforms in Malaysia and Korea (2010–2025)

Aspect	Malaysia	Korea
Curriculum Development & Innovation	<ul style="list-style-type: none"> Important reforms under the Malaysia Education Blueprint 2013–2025. Shift to Outcome-Based Education (OBE) and competency-based modules. Integration of Industry Revolution 4.0 technologies (For example, AI, IoT, AR and VR, robotics, and sustainable technologies). Extensible pathways with credit transfer and Recognition of Prior Learning (RPL). Long suit for blended and digital learning post-COVID. 	<ul style="list-style-type: none"> Introduction and implementation of Meister High Schools (2010), modelled after Germany's vocational system. Having full autonomy in designing the curriculum to meet industry demands. Introduction and implementation of National Competency Standards (NCS) since 2014. Work-Learning Dual System to integrate study and job training. Emphasis on specialised high-technology fields (for example, semiconductors, AI).
Student Outcomes (Employment & Skills)	<ul style="list-style-type: none"> Increase in student enrolment. Employability rose from 70% to 85%. Graduates are harnessed with technical, digital, and soft skills. Vigorous industry satisfaction. National Dual Training System (NDTS) and RPL support smooth workforce entry. 	<ul style="list-style-type: none"> Promising employment outcomes, especially for Meister graduates (It is reported to have more than 90% employment). Job satisfaction and exceptional job-skill match. However, the overqualification issue (reported at 31%) persists, with gaps in soft and digital skills.
Industry Collaboration & Practical Training	<ul style="list-style-type: none"> Active collaboration via the MTVET Council (2021), coordinating 12 ministries. NDTS integrates classroom and workplace learning. Partnerships with major industry partners (For example, Siemens, Toyota, Petronas). HRD Corp funds and supports upskilling. 	<ul style="list-style-type: none"> Properly structured state-led but industry-driven system. Meister schools are closely connected with industries (in the areas of curriculum, internships, and employment). Dual System, in which companies pay salaries, and the government funds education. Supported and funded by the Employment Insurance System. Encouraging employer involvement in training.
Governance & System Structure	<ul style="list-style-type: none"> Multi-agency coordination improved through the MTVET Council, but has historically been fragmented. Enhanced alignment across ministries and institutions. 	<ul style="list-style-type: none"> Emphasis on centralised and state-driven governance, with proper coordination. Use of sector skills councils and labour market forecasting. OECD recommends improving multi-level coordination further.
Global Benchmarking & Quality Assurance	<ul style="list-style-type: none"> Governed by the Malaysian Qualifications Framework (MQF) and accredited by the Malaysian Qualifications Agency (MQA). Having benchmarked with ASEAN University Network (AUN) and UNESCO-UNEVOC. Active international collaborations and dual certifications approaches. 	<ul style="list-style-type: none"> National qualification framework aligned with international standards. Excellent quality assurance through standardisation and continuous evaluation. Global recognition enhanced through international skills competitions.
Adaptation to Industry Revolution 4.0	<ul style="list-style-type: none"> Elevated by Industry4WRD policy and TVET Industry Revolution 4.0 (IR4.0) masterplan. Curriculum design includes immersive technologies and promotes lifelong learning. 	<ul style="list-style-type: none"> Focus on high-technology industries (For example, AI, robotics, semiconductors). Continuous updates and monitors via NCS. However, gaps in issues remain in digital and soft skills among the workforce.
Lifelong Learning & Adult Education	<ul style="list-style-type: none"> Promoted through RPL, flexible learning pathways, and industry-led training. HRD Corp funds and supports upskilling. 	<ul style="list-style-type: none"> Emphasis on education and lifelong learning for adults, but OECD highlights the need for better governance and inclusivity, especially for disadvantaged groups.
Impact of COVID-19	<ul style="list-style-type: none"> Elevated transition and evolution to online and blended learning (2020–2022). Practice of simulations, virtual labs, and hybrid internships. Enhanced provision of digital infrastructure via government initiatives. 	<ul style="list-style-type: none"> Expansion of online and hybrid learning, especially education for adults. Focus on reskilling. Challenges include digital access inequality, especially among older learners.
Strengths	<ul style="list-style-type: none"> Flexible learning pathways, active global benchmarking, increasing employability, and growing industry collaboration. 	<ul style="list-style-type: none"> High employment rates, active industry alignment and engagement, properly structured dual system, high-status vocational education (Meister model).
Challenges	<ul style="list-style-type: none"> Having coordination across agencies and institutions, ensuring consistent quality, and adapting to IR4.0 demands. 	<ul style="list-style-type: none"> Overqualification, skills and job mismatch (For example, soft and digital skills), governance complexity in education for adults.

6. Conclusion

The review concludes that Malaysia and Korea have attained substantial advancements in their TVET systems between 2010 and 2025. Both countries exhibit strengths to meet timely industry needs. Malaysia has implemented several approaches, such as enhancing students' access to education, implementing a competency-based curriculum, integrating industry through the National Dual Training System, and adopting digital learning. Whilst Korea prioritises the efficacy of having prestigious Meister High Schools, the introduction of National Competency Standards, and the implementation of a dual work-learning framework. Both countries achieved an increase in employability; however, challenges persist regarding social stigma, governance policies and master plans, skill and job mismatches, and digital accessibility.

Malaysia and Korea need to focus on long-term growth, embrace digital transformation, and promote lifelong learning to prepare for Industry Revolution 5.0. Establishing AR/VR labs, micro-credentials, and cross-border apprenticeships through collaborative projects could substantially enhance both systems. It is recommended that regional integration be accelerated through stronger partnerships with small and medium-sized industries, Centres of Excellence, and frameworks that span the entire ASEAN region. Besides, effective governance and robust financial frameworks that facilitate collaboration are essential for strengthening cooperative efforts.

Malaysia and Korea could work together to run ASEAN TVET projects and demonstrate how to be more environmentally friendly, more flexible in the workplace, and more diverse as learners. This partnership could help both countries achieve their long-term development goals beyond 2035.

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