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International Models of Student Tracking into Vocational Pathways after Lower Secondary Education: Lessons for Vietnam

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ABSTRACT

Student tracking into technical and vocational education and training (TVET) pathways following lower secondary education is increasingly recognized as a strategic approach to strengthening workforce development, facilitating school-to-work transitions, and driving sustainable economic growth. However, designing tracking systems that balance educational efficiency with social equity remains a significant policy challenge. Thus, this study identifies, compares, and evaluates major international models of TVET student tracking to derive transferable policy insights for Vietnam's post-Grade 9 education reforms. Using a qualitative comparative policy analysis approach, we synthesized peer-reviewed literature, international organization reports, and official policy documents. Findings reveal that successful tracking systems across diverse contexts consistently exhibit five core features: coherent governance, robust school–industry partnerships, comprehensive career guidance, flexible and permeable pathways, and tight alignment with labor market needs. Rather than replicating a single model, Vietnam should adapt these institutional principles to its specific socio-economic and cultural context. Ultimately, this study contributes to the comparative TVET literature and provides actionable, evidence-based recommendations to enhance governance, employer engagement, pathway flexibility, and lifelong learning in Vietnam.

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1. INTRODUCTION

Transition from lower to upper secondary education is a consequential stage because this is often the first point at which students enter differentiated academic or vocational pathways. Selection mechanisms—including examinations, prior achievement, teacher recommendations, parental preferences, career guidance, and second-chance opportunities—can influence access to qualifications, higher education, and employment (Biewen & Thiele, 2020; Merino et al., 2021; Perico e Santos, 2023; Stronati, 2023). In many OECD countries, vocational education and training begins after compulsory lower secondary education. It provides pathways aligned with learners' interests and career aspirations while supplying labor markets with occupationally relevant competencies. However, systems differ in curriculum, workplace learning, admission requirements, governance, and progression opportunities (Ho & Le, 2025; Huynh et al., 2026; OECD, 2023b, 2025a; Stronati, 2023). Tracking therefore distributes not only students but also educational opportunities and occupational prospects (Birkelund et al., 2021; Gamoran, 2010; Shavit & Müller, 2000). Comparative evidence indicates that outcomes depend more on institutional design than on differentiation itself. Early or rigid tracking may reproduce inequalities associated with socioeconomic background, prior achievement, parental expectations, and institutional judgments, without necessarily improving average performance (Hanushek & Wößmann, 2006; Huynh & Le, 2025; Ozer & Perc, 2020; Schindler et al., 2024; Sevilla & Polesel, 2022; Tarabini et al., 2022). Vocational pathways may nevertheless improve initial school-to-work transitions when qualifications communicate recognized occupational competencies. Their long-term value depends on balancing specialization with broad and transferable knowledge so that graduates can adapt to technological and occupational change (Blommaert et al., 2020; Forster et al., 2016; Hanushek et al., 2017). Accordingly, contemporary research examines career guidance, employer participation, pathway flexibility, second-chance mechanisms, and access to higher education (Antelm-Lanzat et al., 2020; Nguyen, 2025; OECD, 2023a, 2023c, 2025b; Perico e Santos, 2023; Schmees et al., 2025). Career education and workplace exposure before pathway selection can further support informed decisions (Kettunen, 2024; Kettunen et al., 2023; Thomsen et al., 2024).

Against this background, the study examines Germany, Switzerland, Singapore, South Korea, Japan, and China because these countries represent established but contrasting approaches to vocational tracking and offer potentially relevant lessons for Vietnam. Germany and Switzerland exemplify dual systems combining vocational-school instruction with enterprise training, shared governance, occupational standards, recognized qualifications, and progression to professional and higher education (Bolli et al., 2021; CEDEFOP, 2024b; Hoeckel et al., 2009; Nguyen et al., 2026; OECD, 2025; SERI, 2025). Singapore combines differentiated academic, technical, and applied pathways with career guidance, continuing skills development, and movement between educational levels (Ho & Lee, 2022; ITE, 2023; MOE Singapore, 2023a, 2023b; SSG, 2023; UNESCO-UNEVOC, 2021; Varaprasad, 2024). South Korea operates specialized vocational and Meister high schools aligned with industrial priorities, although university-oriented aspirations continue to affect vocational participation and status (Jones & Beom, 2022; Lee, 2018; MOE Korea, 2023a, 2023b; OECD, 2023d). Japan integrates general and vocational subjects through specialized and integrated upper secondary courses (MEXT, 2023; OECD, 2024a). China maintains a large school-based system while pursuing parity, industry cooperation, and improved progression, despite continuing concerns about quality, earnings, selection, and public perceptions (Dai & Martins, 2024; Guo & Wang, 2020; Liu et al., 2024; MOE China, 2022; NPC, 2022; Tran et al., 2024; Wang & Wang, 2023). These cases demonstrate the importance of credible qualifications, employer engagement, relevant curricula, workplace exposure, guidance, and progression opportunities (ADB, 2021;

OECD, 2023a). Vietnam should adapt these principles to its governance, labor market, institutional capacity, and streaming policies rather than transfer foreign models mechanically (GIZ & BIBB, 2023; Ho et al., 2023; Kataoka et al., 2020; OECD, 2020; PMV, 2018; WB, 2023). Vietnam has established a policy framework for diversifying pathways after lower secondary education. Decision No. 522/QĐ-TTg emphasizes career education, vocational orientation, institutional cooperation, and alternatives for Grade 9 graduates (Kataoka et al., 2020; OECD, 2020; PMV, 2018). Implementation remains uneven, however, as university education continues to attract more students despite increasing demand for technical, practical, and digital competencies (ILO, 2022a; Kataoka et al., 2020; OECD, 2020).

Vocational participation is constrained by weak articulation, uneven guidance, limited occupational information, insufficient employer cooperation, and concerns about quality and progression (GIZ & BIBB, 2023; Ho et al., 2023; Kataoka et al., 2020; OECD, 2020; Parajuli et al., 2020; PMV, 2018; Tran & Pham, 2026). Guidance should involve students, families, schools, institutions, employers, and communities while addressing interests, abilities, learning preferences, and career opportunities (Antelm-Lanzat et al., 2020; Anyamene & Ngwakwe, 2020; Fitzpatrick & Costantini, 2022; Holland, 1997; Le et al., 2020). Reform must therefore extend beyond enrolment targets by strengthening governance, qualifications, employer participation, workplace learning, credit recognition, bridging programs, re-entry, and higher-education progression (Biewen & Thiele, 2020; OECD, 2023c, 2024b; Perico e Santos, 2023; Schmees et al., 2025; UNESCO, 2018). Employer-linked programs can improve school-to-work transitions, but narrow specialization may restrict adaptability (Blommaert et al., 2020; Bolli et al., 2021; Eichhorst et al., 2015; Hanushek et al., 2017; Wheelahan, 2015). Equity is equally important because rigid differentiation can reproduce social disadvantage (Birkelund et al., 2021; Hanushek & Wößmann, 2006; Schindler et al., 2024; Sevilla & Polesel, 2022; Shavit & Müller, 2000; Tarabini et al., 2022). Vietnam should adapt international principles concerning governance, curricula, guidance, employer engagement, permeability, and lifelong learning to national conditions rather than copy foreign systems directly (ADB, 2021; OECD, 2025a, 2025b, 2025c; Phillips & Ochs, 2004; Phillips & Schweisfurth, 2014; Tran et al., 2024; UNESCO, 2021). The aim of this study is to examine international models of student tracking into vocational pathways after lower secondary education and identify lessons that can inform vocational education policy and practice in Vietnam. The study is guided by the following main research question: What lessons can Vietnam learn from international models of student tracking into vocational pathways after lower secondary education? To address this overarching question, the study investigates three sub-questions:

1) What major models of vocational tracking exist internationally?

2) What are the principal strengths and limitations of these vocational tracking models?

3) Which elements of international vocational tracking models are most applicable to Vietnam?

Theoretically, the study integrates student tracking, skill formation, labor-market coordination, and educational mobility. Human capital and social reproduction theories explain how education develops productive competencies while differentiated pathways may reproduce inequality; the political economy of skill formation highlights the roles of governments, employers, institutions, and social partners. Tracking is conceptualized as a continuing process shaped by governance, employer participation, guidance, curricular differentiation, second-chance mechanisms, and pathway flexibility. Practically, the findings support improvements in guidance, curricula, qualification recognition, employer collaboration, and educational progression in Vietnam. Ultimately, the study proceeds to

promote equitable, flexible, labor-market-responsive pathways supporting lifelong learning and sustainable development.

2. LITERATURE REVIEW

2.1. Concept of student tracking

Student tracking refers to the institutional allocation of learners to differentiated programs, curricula, or school types according to academic achievement, assessed ability, interests, aspirations, parental preferences, and teacher recommendations (Gamoran, 2010; Oakes & Guiton, 1995; Perico e Santos, 2023). Because tracks may lead to different qualifications, higher-education opportunities, occupations, and employment outcomes, tracking has significant implications for human-capital development, equity, and social mobility (Becker, 1993; Birkelund et al., 2021; Hanushek & Wößmann, 2006; Schindler et al., 2024). Tracking differs from within-school ability grouping because it separates students across programs or institutions with distinct curricula and expected destinations (Gamoran, 2010; Sevilla & Polesel, 2022). Allocation may occur before or after compulsory education through examinations, academic records, recommendations, preferences, or combined mechanisms (OECD, 2023c, 2024b; Stronati, 2023). Its effects depend on selection timing, allocation transparency, pathway quality, social status, and opportunities for mobility. Early or rigid tracking may reproduce disadvantage, whereas transfers and second-chance options can reduce the consequences of initial placement (Biewen & Thiele, 2020; Hanushek & Wößmann, 2006; Ozer & Perc, 2020; Tarabini et al., 2022). Vocational pathways combine general and occupational learning, practical training, workplace experience, and recognized qualifications. Contemporary systems increasingly emphasize progression, permeability, broad knowledge, and informed career choice (Antelm-Lanzat et al., 2020; CEDEFOP, 2024a; Kettunen, 2024; Nguyen et al., 2026; OECD, 2023a, 2025a; Schmees et al., 2025; Thomsen et al., 2024; UNESCO, 2018; Wheelahan, 2015).

2.2. Types of student tracking

Comparative research identifies four broad forms of student tracking: early, late, academic–vocational, and flexible tracking. They differ in timing, selection criteria, curricular specialization, institutional separation, and opportunities for movement between pathways. Early tracking places students in differentiated programs before or shortly after lower secondary education. Germany, Austria, and Switzerland combine relatively early differentiation with established vocational routes (CEDEFOP, 2023, 2024b; OECD, 2025a; SERI, 2025). Earlier specialization may support occupational preparation where schools, employers, chambers, and social partners cooperate (Bolli et al., 2021; Eichhorst et al., 2015; Hanushek et al., 2017). However, decisions made while student abilities and interests are developing may reflect family resources, parental expectations, and institutional perceptions, thereby reproducing inequality (Bourdieu & Passeron, 1990; Hanushek & Wößmann, 2006; Nguyen, 2025; Schindler et al., 2024). Late tracking postpones differentiation until students complete a longer period of common education. Finland and other Nordic systems generally retain comprehensive schooling before general or vocational upper secondary education, allowing more time for academic development and career exploration (EDUFI, 2024; Kettunen, 2024; OECD, 2025a; Thomsen et al., 2024). Yet choices remain influenced by achievement, socioeconomic background, parental expectations, relative age, and access to information (Birkelund et al., 2021; Kohlmeier & Fischer-Neumann, 2024; Oterhals et al., 2023; Schindler et al., 2024). Effective late tracking therefore requires career education, counselling, and workplace exposure (Antelm-Lanzat et al., 2020; Huynh & Le, 2025; Kettunen et al., 2023; Thomsen et al., 2024).

Academic–vocational tracking separates programs by orientation and destination. Academic routes emphasize theoretical learning and university preparation, whereas vocational routes combine general education, occupational knowledge, practical training, and workplace learning (Merino et al., 2021; OECD, 2023b, 2023c). Vocational programs can improve youth labor-market integration when qualifications are recognized and employers participate meaningfully (Blommaert et al., 2020; Bolli et al., 2021; Eichhorst et al., 2015; Huynh et al., 2026). However, they may reinforce stratification when treated as lower-status destinations for disadvantaged students (Guo & Wang, 2020; Sevilla & Polesel, 2022; Shavit & Müller, 2000; Wang & Wang, 2023). Specialized training must also include broad knowledge, digital skills, and transferable capabilities to support long-term adaptability (Forster et al., 2016; Hanushek et al., 2017; OECD, 2023a; Wheelahan, 2015). Flexible tracking permits movement through credit transfer, bridging programs, recognition of prior learning, re-entry, and multiple routes to higher education. These mechanisms provide second-chance opportunities (Biewen & Thiele, 2020; OECD, 2024b, 2025b; Schmees et al., 2025; UNESCO, 2018). Singapore combines differentiated routes with guidance, continuing education, and skills upgrading, while Finland emphasizes individualized learning and progression to further study (EDUFI, 2024; Ho & Lee, 2022; Ho & Le, 2025; MOE Singapore, 2023a, 2023b; SSG, 2023; Varaprasad, 2024). Tracking encompasses governance, selection, curriculum, labor-market coordination, and mobility. Dual systems rely strongly on employers, school-based systems on public regulation, and flexible systems on permeability and lifelong learning (OECD, 2023a, 2025a; WB, 2023). Vietnam should adapt transferable principles—guidance, employer participation, quality assurance, broad curricula, and progression routes—rather than copy one model (Antelm-Lanzat et al., 2020; GIZ & BIBB, 2023; OECD, 2020; Phillips & Ochs, 2004).

2.3. International debates on student tracking

Student tracking remains contested because it affects educational efficiency, skill formation, school-to-work transitions, social mobility, and equality. Comparative evidence indicates that outcomes depend less on differentiation itself than on selection timing, curricular quality, career guidance, employer participation, and pathway permeability (Hanushek & Wößmann, 2006; OECD, 2023c, 2024b; Ozer & Perc, 2020; Perico e Santos, 2023). Human capital theory views differentiated education as a means of developing productive and occupational skills (Becker, 1993). Social reproduction theory, however, warns that placement may reflect family background, cultural capital, parental expectations, and institutional judgments as well as ability (Bourdieu & Passeron, 1990; Shavit & Müller, 2000; Tarabini et al., 2022). Differentiated pathways can broaden curricular choice by recognizing technical, practical, and interpersonal competencies alongside academic achievement. They may also accommodate students with different interests, learning preferences, and occupational aspirations (Becker, 1993; OECD, 2023b, 2023c; Stronati, 2023). Their effectiveness, however, depends on informed selection supported by counselling, workplace exposure, and reliable information about qualifications and progression routes (Antelm-Lanzat et al., 2020; Fitzpatrick & Costantini, 2022; Kettunen, 2024; Kettunen et al., 2023; Perico e Santos, 2023; Thomsen et al., 2024). Vocational education can strengthen school-to-work transitions when it combines general learning, occupational preparation, practical experience, and recognized qualifications (Blommaert et al., 2020; Hanushek et al., 2017; OECD, 2025c). Germany and Switzerland demonstrate how governments, employers, chambers, schools, and social partners can align curricula and assessment with occupational standards (Bolli et al., 2021CEDEFOP, 2024b; Eichhorst et al., 2015). Apprenticeships may improve initial employment, although outcomes remain dependent on labor demand and firms' capacity to provide quality training (Eichhorst et al., 2015; Hanushek et al., 2017; OECD, 2025c). Modern vocational curricula

increasingly combine occupational expertise with general knowledge, digital literacy, communication, teamwork, and problem-solving (OECD, 2023a; UNESCO, 2021). Singapore illustrates how career guidance, industry collaboration, skills upgrading, and progression routes can connect technical education with lifelong learning (Ho & Lee, 2022; ITE, 2023; MOE Singapore, 2023a, 2023b; SSG, 2023; Varaprasad, 2024).

Early or rigid differentiation may reproduce inequality because placement can reflect unequal prior opportunities, family background, and institutional judgments about ability (Birkelund et al., 2021; Bourdieu & Passeron, 1990; Hanushek & Wößmann, 2006; Schindler et al., 2024; Sevilla & Polesel, 2022; Shavit & Müller, 2000). Early decisions may also treat temporary achievement differences as permanent, limiting students whose abilities and aspirations develop later (Kohlmeier & Fischer-Neumann, 2024; Oakes & Guiton, 1995; Oterhals et al., 2023). Rigid pathways may restrict transfer and higher-education access. Bridging programs, credit transfer, modular qualifications, and recognition of prior learning can reduce these effects (EDUFI 2024; OECD, 2025b; Schmees et al., 2025; UNESCO, 2018). Narrow specialization may also weaken long-term adaptability (Forster et al., 2016; Hanushek et al., 2017; UNESCO, 2021; Wheelahan, 2015). Vocational stigma persists where academic education enjoys greater status, as evidence from China demonstrates (Dai & Martins, 2024; Guo & Wang, 2020; Liu et al., 2024; Wang & Wang, 2023). Status appears to improve when programs can provide credible qualifications, workplace learning, favorable employment outcomes, and advancement routes (Bolli et al., 2021; CEDEFOP, 2024b; Institute of Technical Education, 2023; Varaprasad, 2024).

2.4. International models of vocational tracking

International vocational tracking systems differ in governance, curriculum organization, student allocation, workplace learning, and labor-market relationships. These differences reflect national histories, political institutions, economic structures, industrial strategies, and attitudes toward academic and vocational education. Comparative analysis must, therefore, examine who governs vocational education, how learning is divided between schools and workplaces, how employers participate, and whether qualifications support higher education and lifelong learning (Asian Development Bank, 2021; OECD, 2023a, UNESCO, 2021). Thus, this study uses four ideal types based on the balance between school- and workplace-based learning, the distribution of responsibility between governments and employers, and pathway permeability. Since national systems often combine several types, these categories are analytical rather than mutually exclusive.

Model 1: Dual system model

The Dual System Model combines vocational-school instruction with regulated enterprise-based apprenticeships. Students acquire general education, occupational theory, practical competence, and workplace experience while preparing for recognized occupations. This integration can facilitate transitions into skilled employment because qualifications signal specific competencies and learners gain authentic experience before graduation (Blommaert et al., 2020; Eichhorst et al., 2015; Hanushek et al., 2017). Germany, Switzerland, and Austria are prominent examples. Enterprise training constitutes a formal qualification component, while vocational schools provide general and occupational education (Bolli et al., 2021; CEDEFOP, 2023, 2024b; OECD, 2025a; SERI, 2025). Collective governance distributes responsibility for curricula, occupational standards, assessment, certification, financing, and quality assurance among governments, employers, chambers, professional organizations, trade unions, and schools (Eichhorst et al., 2015). In Germany, chambers oversee apprenticeship contracts, training quality, examinations, and certification (CEDEFOP, 2024b; LCS, 2022; OECD, 2025a; KMK, 2025a, 2025b). Switzerland combines enterprise learning, vocational

schooling, and intercompany courses with progression to professional and higher education (Bolli et al., 2021; Hoeckel et al., 2009; SERI, 2025), while Austria combines apprenticeships with vocational schools and colleges (CEDEFOP, 2023; OECD, 2025a). Employer participation strengthens curriculum relevance and qualification credibility, while workplace learning develops technical and transferable competencies (ADB, 2021; Bolli et al., 2021; CEDEFOP, 2024a; Eichhorst et al., 2015; OECD, 2023a). Qualifications should also support retraining and further education (OECD, 2023a, 2025b; Schmees et al., 2025; UNESCO, 2018). Although the model supports favorable initial employment, its effectiveness depends on firms' training capacity, apprenticeship availability, and effective monitoring (Blommaert et al., 2020; Bolli et al., 2021; Eichhorst et al., 2015; Hanushek et al., 2017). Access may reflect social background and employer selection, while narrow specialization may weaken long-term adaptability (Forster et al., 2016; Hanushek et al., 2017; OECD, 2023a; Schindler et al., 2024; Shavit & Müller, 2000; UNESCO, 2021).

Model 2: School-based vocational model

In the School-Based Vocational Model, vocational schools and colleges provide most instruction, assessment, and student support under substantial government direction. Public authorities regulate curricula, qualifications, financing, teacher preparation, and quality assurance, while employers contribute through internships, consultation, equipment provision, assessment, partnerships, and recruitment. Workplace learning is therefore less institutionalized than in mature dual systems (ADB, 2021; OECD, 2023a, UNESCO, 2021). South Korea and China illustrate this model. South Korea developed vocational, specialized, and Meister high schools to support industrial modernization and strategic sectors. National authorities oversee policy, curricula, funding, teacher preparation, and quality assurance, while employers participate through internships, institutional partnerships, consultation, and recruitment (Jones & Beom, 2022; Lee, 2018; OECD, 2023d). Government investment supports laboratories, digital infrastructure, specialist teachers, and general education, although university-oriented aspirations and uneven employer involvement continue to reduce vocational participation (Jones & Beom, 2022; Lee, 2018; OECD, 2023a). China directs students toward academic or vocational routes after junior secondary education. Recent reforms promote parity, industry–education integration, teacher development, and progression across qualification levels. School–enterprise cooperation includes internships, modern apprenticeships, joint programs, equipment support, and competency development (ADB, 2021; MOE China, 2022; NPC, 2022). The model supports coordinated expansion, standardized qualifications, public investment, and alignment with national priorities. Its effectiveness may be weakened when curricula, equipment, teacher expertise, and employer engagement lag behind technological change (Lee, 2018). Concerns also remain about prior achievement, program quality, earnings, and vocational status (Dai & Martins, 2024; Guo & Wang, 2020; Liu et al., 2024; Wang & Wang, 2023). Effective school-based systems therefore require credible qualifications, structured employer partnerships, career guidance, authentic workplace learning, and transparent progression routes (Antelm-Lanzat et al., 2020; OECD, 2023a, 2025b; UNESCO, 2018).

Model 3: Flexible pathway model

The Flexible Pathway Model combines educational differentiation with mobility, re-entry, and lifelong learning. Rather than making initial placement permanent, it provides multiple entry, transfer, exit, and progression points through recognition of prior learning, modular qualifications, and movement between academic, vocational, and higher education. It recognizes that learners' abilities, circumstances, interests, and career goals may change over time (OECD, 2023a, 2024b, 2025b; Schmees et al., 2025; UNESCO, 2018, 2021). Singapore

and Finland illustrate this model in different institutional contexts. Both connect vocational education with continuing learning, career development, labor-market adaptation, and further study rather than treating it as a terminal destination (Ho & Lee, 2022; OECD, 2025a; SSG, 2023; Varaprasad, 2024). Singapore offers academic, technical, and applied routes through junior colleges, polytechnics, and the Institute of Technical Education. Articulated pathways support progression from technical qualifications to diplomas and universities, while subject-level differentiation reduces rigid streaming (ITE, 2023; Lee & Ho, 2022; UNESCO-UNEVOC, 2021). Career guidance and SkillsFuture extend flexibility into adulthood, while state-coordinated cooperation involves government, institutions, and employers in curricula, training, assessment, and recruitment (LCS, 2022; MOE Singapore, 2023a; OECD, 2024b). Finland delays formal differentiation until comprehensive education is completed. General and vocational qualifications support further study, competence-based provision recognizes prior learning, and workplace learning includes training agreements and apprenticeships. Employers support assessment, while institutions retain responsibility for qualifications and quality assurance (EDUFI, 2024; OECD, 2025a). Early career education also supports occupational exploration (Kettunen, 2024; Kettunen et al., 2023). Flexible systems can promote equity through transfer, individualized learning, and second-chance opportunities, but formal permeability may remain unequal when learners face informational, financial, admissions, or status barriers (Antelm-Lanzat et al., 2020; OECD, 2024b; Schindler et al., 2024). Effective implementation requires accessible guidance, employer cooperation, curriculum renewal, transparent qualifications, institutional capacity, and sustained investment (Antelm-Lanzat et al., 2020; OECD, 2023a; WB, 2023).

Model 4: Hybrid model

The Hybrid Model integrates general education, vocational specialization, practical learning, and industry collaboration within mainstream upper secondary education. Students develop occupational competencies while continuing academic studies and retaining access to employment, apprenticeships, further vocational training, and higher education (MEXT, 2023; NCVER, 2024; OECD, 2023c). Japan and Australia illustrate different forms of hybrid provision. Japanese upper secondary schools offer general, specialized, and integrated courses. Specialized programs cover occupational fields such as agriculture, industry, commerce, fisheries, information, welfare, and nursing, while integrated courses allow students to combine academic and vocational subjects according to their interests and future plans (OECD, 2024a). Schools cooperate with industries, local governments, technical colleges, and community organizations through internships, workplace visits, projects, and technical guidance. However, vocational learning remains largely school based, employer responsibility is less formalized than in dual systems, and the prestige of university-oriented education may reduce participation (Juwitasari, 2024; OECD, 2024a). Australia's VET in Schools enables students to complete recognized vocational subjects or qualifications alongside a senior secondary certificate. Schools, Technical and Further Education institutions, and registered training organizations deliver classroom instruction, practical training, structured workplace learning, apprenticeships, and traineeships. Outcomes vary up to provider capacity, qualification level, resources, and employer participation (NCVER, 2024). Hybrid provision broadens access to occupational learning without permanent placement in separate institutions and may reduce the academic–vocational divide (OECD, 2023c; Sevilla & Polesel, 2022). Its effectiveness depends on qualified teachers, current equipment, employer engagement, authentic workplace learning, recognized qualifications, and credible progression routes (ADB, 2021; MEXT, 2023; NCVER, 2024). Nevertheless, vocational courses may remain concentrated among disadvantaged students or receive weaker recognition in higher education and employment (Gamoran, 2010; Sevilla & Polesel, 2022; Tarabini et al., 2022). Broad

knowledge, career guidance, and recognized progression are therefore essential to prevent vocational learning from becoming a lower-status alternative (OECD, 2023a; Sevilla & Polesel, 2022; Wheelahan, 2015).

2.5. Conceptual framework

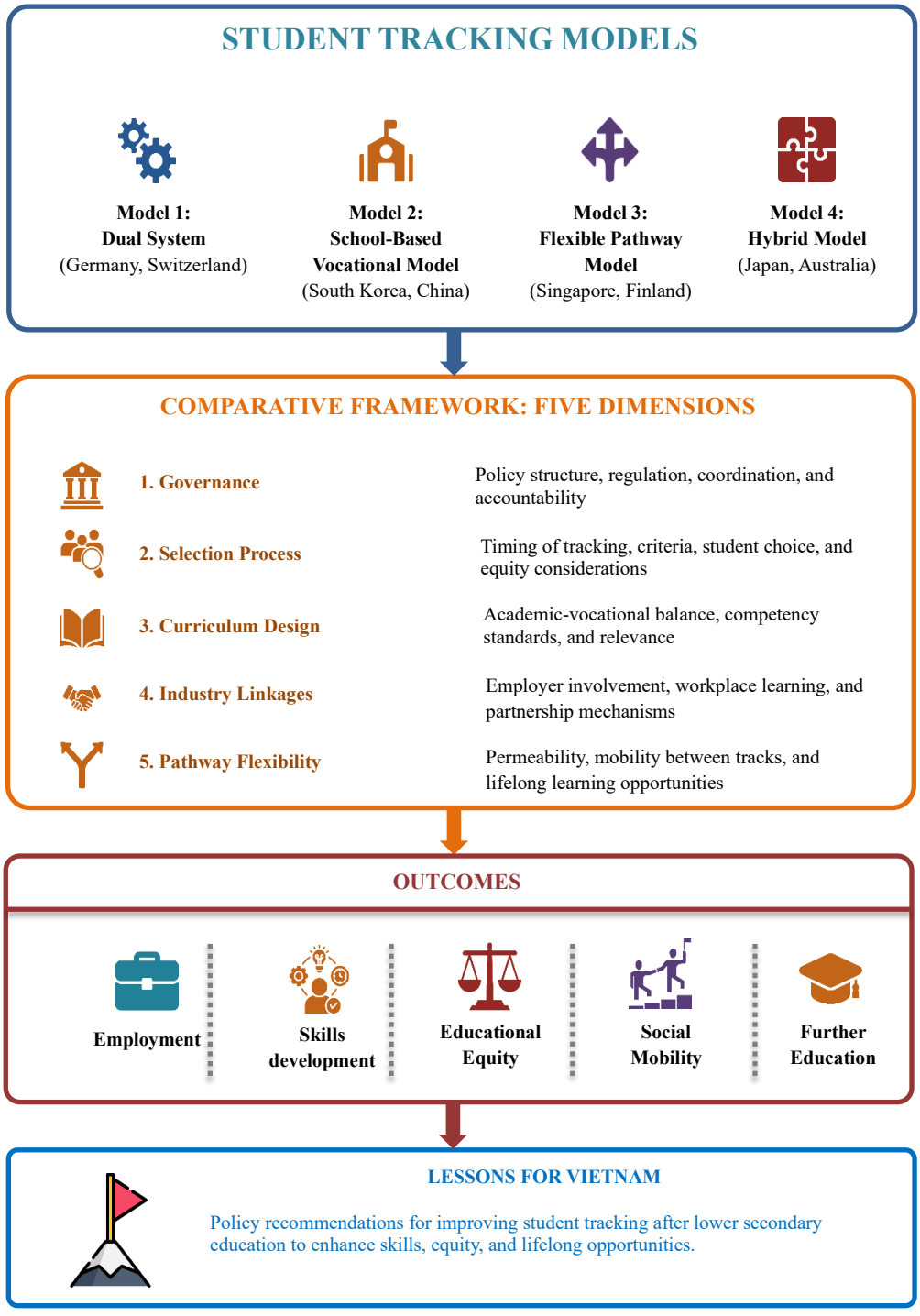


Figure 1. Conceptual framework of this study

Figure 1 presents the framework for comparing international vocational tracking models and identifying lessons for Vietnam. It links four elements: models, analytical dimensions, outcomes, and policy implications, while recognizing the influence of national histories, governance, economies, labor markets, and social attitudes. The first element includes four models. The Dual System Model—Germany, and Switzerland—combines vocational schooling with regulated apprenticeships, shared governance, employer participation, recognized qualifications, and progression routes. The School-Based Vocational Model—South Korea and China—relies mainly on publicly regulated institutions, with employers supporting internships, consultation, partnerships, and recruitment. The Flexible Pathway Model—Singapore and Finland—emphasizes individualized learning, prior-learning recognition, continuing education, and movement between vocational and academic levels. The Hybrid Model—Japan and Australia—integrates vocational and academic learning within mainstream upper secondary education. The second element applies five dimensions: governance, selection, curriculum, industry linkages, and pathway flexibility. These examine coordination, equitable allocation, curriculum balance, employer participation, and transfer or progression opportunities. The third element evaluates employment, skills, school-to-work transition, equity, mobility, adaptability, and further education. Finally, the framework derives context-sensitive lessons rather than advocating direct policy transfer. For Vietnam, priorities include governance coordination, career guidance, employer engagement, curriculum quality, workplace learning, qualification recognition, and permeable progression routes.

3. Methodology

3.1. Research design

This study employs a qualitative comparative literature review and comparative policy analysis to examine international models of student tracking into vocational pathways after lower secondary education and identify lessons for Vietnam. This design enables systematic comparison of educational policies, governance arrangements, curricula, implementation mechanisms, and socioeconomic contexts without assuming that one model is universally superior (Phillips & Schweisfurth, 2014). The analysis covers four models: the Dual System Model in Germany and Switzerland, the School-Based Vocational Model in South Korea and China, the Flexible Pathway Model in Singapore and Finland, and the Hybrid Model in Japan and Australia.

3.2. Data sources

The study uses secondary data from academic publications, international organizations, and national authorities. Peer-reviewed literature was retrieved from Scopus, Web of Science, ERIC, and Google Scholar, prioritizing sources published between 1990 and 2025. Policy evidence was obtained from the ADB, CEDEFOP, ILO, OECD, UNESCO, WB, and relevant national governments. Official laws, strategies, policy documents, and statistical reports were reviewed to examine vocational governance, qualifications, student selection, curriculum, employer participation, and progression pathways. Using multiple source types supported data triangulation and strengthened the credibility of the findings (Creswell & Creswell, 2018).

3.3. Inclusion and exclusion criteria

Sources were included when they addressed student tracking, vocational education, apprenticeships, career guidance, upper secondary pathways, or school-to-work transitions in the selected countries. Eligible materials comprised peer-reviewed studies indexed in major academic databases and authoritative reports issued by international organizations or governments between 1990 and 2025. Duplicate publications, opinion articles, methodologically weak studies, and sources unrelated to vocational tracking after lower secondary education were excluded.

3.4. Country selection and literature search

Countries were selected purposefully according to three criteria: the existence of established vocational pathways, representation of contrasting institutional models, and potential relevance to Vietnam. Purposeful selection is appropriate in comparative education when cases are chosen to illuminate institutional similarities and differences rather than achieve statistical representativeness. Searches were made with combined terms such as student tracking, vocational pathways, TVET, dual system, career guidance, and school-to-work transition with country names and Boolean operators. Reference lists were also examined to locate additional relevant sources.

3.5. Data analysis

Comparative policy analysis applied common criteria to each country: entry point, selection mechanisms, governance, curriculum, industry partnerships, pathway flexibility, and educational outcomes (Phillips & Schweisfurth, 2014). Thematic analysis then followed Braun and Clarke's (2006) six-phase procedure. Coding identified seven themes: governance, selection, career guidance, employer involvement, equity, social perceptions, and pathway flexibility. Trustworthiness was enhanced through source triangulation, transparent selection criteria, consistent analytical dimensions, and context-sensitive interpretation (Creswell & Creswell, 2018). As the study used publicly available secondary sources and involved no human participants, formal ethical approval was unnecessary. Academic integrity was maintained through accurate interpretation and APA 7th-edition citation.

4. FINDINGS

4.1. Comparative findings of international vocational tracking models

Comparative analysis of vocational tracking systems in Germany, Switzerland, Singapore, South Korea, China, and Japan indicates that successful systems differ in institutional design but share several fundamental characteristics (Table 1). Rather than relying on a single organizational model, countries have developed vocational pathways that reflect their historical traditions, governance arrangements, labor market institutions, and national development priorities. Despite these contextual differences, the evidence consistently highlights the importance of effective governance, employer engagement, flexible educational pathways, comprehensive career guidance, and lifelong learning opportunities as key determinants of successful vocational education.

Table 1. Comparative analysis of international student tracking models

Criteria	Germany	Switzerland	Singapore	Finland	South Korea	China	Japan	Australia
Entry Point	After lower secondary	After lower secondary	Multiple pathways after lower secondary	General or vocational upper secondary after nine-year basic education	Vocational high schools after Grade 9	General or vocational senior secondary after Grade 9	General, specialized, or integrated upper secondary schools	VET can be undertaken during senior secondary education
Selection Method	School recommendation and student choice	Student choice and employer recruitment	Academic performance and student preference	Student choice through joint application or continuous admission	Entrance examination and student preference	Entrance examination and student preference	Entrance examination and student preference	Student choice, school offerings, and state/territory requirements
Governance	Shared government–industry governance	Confederation, cantons, and professional organizations	Strong centralized government	National framework with decentralized provision by education providers	Ministry-led with industry cooperation	Strong centralized government	Ministry-led with local implementation	Shared federal, state/territory, education-provider, and industry responsibilities
Industry Partnership	Very strong apprenticeships	Very strong apprenticeships	Extensive internships and industry advisory committees	Strong workplace learning and competence demonstrations in authentic work settings	School–industry cooperation	School–enterprise cooperation	Internships and local industry collaboration	Strong work-based learning, VET in Schools, and school-based apprenticeships/traineeships)
Pathway Flexibility	High	Very high	Very high	Very high; flexible applications, individualized pathways, and opportunities for upskilling and reskilling	Moderate to high	Increasing	Moderate	High, with combinations of senior secondary, VET, apprenticeships, and further study
Further Education	Higher vocational education and universities	Universities of applied sciences and universities	Polytechnics and universities	Universities and universities of applied sciences; all vocational qualifications provide higher-education eligibility	Colleges and universities	Higher vocational colleges and applied universities	Universities and technical colleges	Further VET, higher education, and credit/pathway opportunities
Overall Strength	Strong labor-market alignment	High permeability	Flexible lifelong learning	Flexible, competence-based pathways and strong progression opportunities	Competency-based reforms	Large-scale workforce development	Academic–vocational integration	Integration of school education, VET, industry learning, and apprenticeship pathways

Governance is one of the most important dimensions distinguishing international vocational tracking systems. Germany and Switzerland operate collaborative governance structures in which responsibilities are distributed among governments, employers, chambers, trade unions, professional organizations, and vocational institutions. This arrangement enables occupational standards, curricula, assessment, and qualifications to remain closely connected to labor-market requirements while distributing responsibility for quality and financing across major stakeholders (Bolli et al., 2021; CEDEFOP, 2024b; OECD, 2025a; SERI, 2025). By contrast, China, Japan, Singapore, and South Korea rely more heavily on government leadership in curriculum regulation, funding, qualification frameworks, and quality assurance. Nevertheless, effective government-led systems also institutionalize employer participation through advisory bodies, workplace learning, curriculum consultation, and school–industry partnerships (ADB, 2021; EDUFI, 2024; MOE China, 2022; MOE Korea, 2023b; NCVER, 2024). Governance effectiveness therefore depends less on centralization alone than on sustained coordination among education providers, public authorities, and labor-market stakeholders. For Vietnam, stronger collaboration among government agencies, vocational institutions, employers, and industry associations is essential for improving training quality and graduate employability (GIZ & BIBB, 2023; Kataoka et al., 2020; OECD, 2020). Student selection varies considerably across systems. Germany and Switzerland combine school achievement, student preferences, institutional recommendations, and employer recruitment into apprenticeship positions. Singapore increasingly emphasizes differentiated learning, career guidance, and multiple progression routes, while Finland postpones academic–vocational differentiation until the completion of comprehensive education (EDUFI, 2024; Ho & Lee, 2022; OECD, 2024b; Perico e Santos, 2023). South Korea, China, Japan, and Australia continue to consider academic performance but have expanded vocational options and progression opportunities. Comparative evidence indicates that selection based solely on examinations may reinforce social inequality and prematurely restrict students whose abilities and aspirations develop later (Hanushek & Wößmann, 2006; Schindler et al., 2024). Effective tracking therefore requires informed student choice supported by career education, counselling, workplace exposure, and transparent information about qualifications and occupations (Antelm-Lanzat et al., 2020; Kettunen et al., 2023; Thomsen et al., 2024).

Employer engagement is a major determinant of vocational quality and labor-market relevance. Germany and Switzerland demonstrate highly institutionalized partnerships in which employers participate directly in apprenticeship delivery, curriculum development, competency standards, assessment, and certification. Other systems rely on internships, workplace learning, school-based apprenticeships, curriculum consultation, and industry advisory committees, although schools remain the principal training providers (Bolli et al., 2021; Eichhorst et al., 2015; NCVER, 2024; WB, 2023). Sustained partnerships are more effective than occasional placements because they create continuing mechanisms for updating curricula and responding to technological change. Vietnam therefore needs stronger institutional incentives for enterprises to participate in curriculum design, practical training, teacher development, and graduate recruitment (GIZ & BIBB, 2023; Ho et al., 2023). Contemporary systems increasingly promote movement between vocational and academic education through credit recognition, bridging programs, recognition of prior learning, and articulated qualifications. Finland, Singapore, Switzerland, and other systems provide routes from vocational education to advanced professional qualifications and higher education, reducing the permanence of initial pathway decisions (Biewen & Thiele, 2020; OECD, 2025b; Schmees et al., 2025; UNESCO, 2018). Flexible pathways can strengthen educational mobility, public confidence, and lifelong learning. Systems combining employer engagement with recognized qualifications generally achieve smoother school-to-work transitions and

stronger initial employment outcomes (Blommaert et al., 2020; Hanushek et al., 2017). However, vocational prestige depends on program quality, employment returns, and credible progression opportunities. Where vocational education is perceived as a second-choice route, participation may remain low despite demand for skilled workers (Guo & Wang, 2020; Liu et al., 2024; Sevilla & Polesel, 2022; Wang & Wang, 2023).

4.2. Key characteristics of successful vocational tracking systems

Comparative analysis indicates that successful vocational tracking systems vary in design but converge around several interdependent characteristics. Stronger systems combine sustained employer engagement, flexible educational routes, effective career guidance, positive social recognition, and lifelong-learning opportunities. These elements reinforce one another: employer participation improves curriculum relevance, permeability reduces the risks of early choice, and progression routes strengthen confidence in vocational education. The most consistent characteristic is structured collaboration between education providers and employers. Industry participation extends beyond short internships to curriculum development, occupational standards, workplace training, assessment, certification, equipment provision, and recruitment. Germany and Switzerland demonstrate institutionalized cooperation, with governments, employers, chambers, vocational schools, and social partners sharing responsibility for apprenticeship quality and qualifications (Bolli et al., 2021; CEDEFOP, 2024b; Eichhorst et al., 2015; OECD, 2025a). School-based systems also benefit when employer engagement is formalized. Singapore, South Korea, China, Finland, Japan, and Australia use advisory bodies, workplace learning, school–enterprise partnerships, and school-based apprenticeships. These mechanisms help institutions update curricula, expose students to authentic work settings, and align qualifications with technological change (ADB, 2021; EDUFI, 2024; ITE, 2023; MOE Korea, 2023b; NCVER, 2024). Employers should therefore function as long-term partners rather than occasional placement providers.

Successful systems reduce the rigidity of academic–vocational differentiation. Flexible routes allow learners to transfer between programs, accumulate credits, receive recognition for prior learning, re-enter education, and progress to higher vocational or university study. Such arrangements recognize that students' interests may evolve and that initial decisions should not permanently determine later destinations (Biewen & Thiele, 2020; OECD, 2024b, 2025b; Schmees et al., 2025; UNESCO, 2018). Finland emphasizes competence-based learning, while Singapore connects technical education, polytechnics, universities, and continuing training through articulated routes. Switzerland supports progression to higher professional education and universities of applied sciences, whereas Australia allows students to combine senior secondary education with recognized vocational qualifications (EDUFI, 2024; ITE, 2023; NCVER, 2024; SERI, 2025). Flexibility makes vocational education a foundation for advancement rather than a terminal option. Career guidance is essential because flexibility is valuable only when students understand available options. Effective systems begin guidance before students leave lower secondary education and integrate self-assessment, occupational information, workplace exposure, counseling, and knowledge of qualification routes. This helps learners relate their interests and abilities to realistic opportunities rather than relying only on examinations, family expectations, or stereotypes (Antelm-Lanzat et al., 2020; Fitzpatrick & Costantini, 2022; Kettunen, 2024; Kettunen et al., 2023; Thomsen et al., 2024). Singapore emphasizes self-awareness, exploration, and informed selection, while Nordic approaches integrate career education and work experience into compulsory schooling. Comprehensive guidance can reduce mismatched choices and support smoother transitions, especially for students with limited family knowledge of vocational routes (MOE Singapore, 2023a; OECD, 2024b). Guidance should therefore be a continuing educational process rather than a one-time placement activity.

Vocational pathways appear to attract students when qualifications are associated with high-quality teaching, modern facilities, recognized credentials, favorable employment outcomes, and further-study opportunities. Germany and Switzerland sustain vocational status through employer recognition and established occupational careers, while Singapore invests in modern technical institutions, progression routes, and lifelong skills development (CEDEFOP, 2024b; ITE, 2023; OECD, 2025a; SSG, 2023; SERI, 2025). Vocational education often remains a second-choice route where students are allocated mainly because of weaker academic performance or uncertain labor-market returns. Evidence from China shows that differences in quality, prior achievement, and employment outcomes can reinforce preferences for academic education (Dai & Martins, 2024; Guo & Wang, 2020; Liu et al., 2024; Wang & Wang, 2023). Improving social status therefore requires demonstrable quality and outcomes, not promotional campaigns alone. Permeability ensures that vocational qualifications connect to advanced study, retraining, and career development. Credit transfer, bridging programs, modular qualifications, recognition of prior learning, and access to higher education allow learners to revise earlier choices and adapt to economic change (OECD, 2023a, 2025b; Schmees et al., 2025; UNESCO, 2018, 2021). This matters because narrowly specialized training may support initial employment but become less advantageous as technologies change (Forster et al., 2016; Hanushek et al., 2017; Wheelahan, 2015). For Vietnam, successful vocational tracking cannot be achieved through enrolment targets alone. Reforms should combine employer participation, high-quality workplace learning, career guidance before Grade 9 completion, recognized qualifications, transparent progression routes, and continuing skills development. These priorities address labor-market relevance, public confidence, and institutional coordination (GIZ & BIBB, 2023; Ho et al., 2023; Kataoka et al., 2020; OECD, 2020; PMV, 2018).

5. DISCUSSION

The findings indicate that successful vocational tracking systems are distinguished less by a single institutional model than by the quality of governance, employer engagement, pathway flexibility, career guidance, and lifelong-learning arrangements. Germany, Switzerland, Singapore, South Korea, China, and Japan, organize vocational education differently, yet their stronger features reflect common principles: institutional coordination, recognized qualifications, labor-market relevance, and opportunities for progression. Vocational tracking should therefore be understood as an integrated policy framework connecting schools, employers, qualification systems, and further education rather than as a narrow mechanism for assigning students to academic or vocational routes.

The findings support Human Capital Theory, which views education and training as investments that increase productivity and contribute to economic development (Becker, 1993). Vocational education is most effective when occupational preparation combines general knowledge, technical competencies, workplace experience, and transferable skills. Such combinations can facilitate school-to-work transitions, particularly where qualifications provide reliable signals of graduates' competencies (Blommaert et al., 2020; Hanushek et al., 2017; OECD, 2025c). However, highly specialized skills may lose value as technologies change, so strong systems also provide broad knowledge and opportunities for reskilling (Forster et al., 2016; Hanushek et al., 2017; UNESCO, 2021; Wheelahan, 2015). Germany and Switzerland illustrate how employer participation strengthens the relationship between education and productivity. Employers, chambers, governments, vocational schools, and social partners jointly contribute to occupational standards, apprenticeships, assessment, and certification, increasing the credibility and responsiveness of qualifications (Bolli et al., 2021; CEDEFOP, 2024b; Eichhorst et al., 2015; SERI, 2025). Singapore demonstrates a more state-coordinated configuration in which technical education, polytechnics, employer collaboration,

and SkillsFuture connect initial preparation with continuing workforce development (Ho & Lee, 2022; ITE, 2023; MOE Singapore, 2023a, 2023b; SSG, 2023; Varaprasad, 2024). Thus, the decisive issue is not centralization itself but whether public authorities, institutions, and employers maintain stable cooperation.

The findings also support concerns associated with Social Reproduction Theory. Tracking may reproduce inequality when pathway allocation reflects family background, cultural capital, prior opportunity, or institutional judgments rather than students' developing capacities (Bourdieu & Passeron, 1990). Early or rigid differentiation can widen inequality and concentrate disadvantaged learners in lower-status pathways (Birkelund et al., 2021; Hanushek & Wößmann, 2006; Schindler et al., 2024; Sevilla & Polesel, 2022; Shavit & Müller, 2000; Tarabini et al., 2022). The central equity question is therefore whether students have access to transparent selection, high-quality programs, second-chance routes, and genuine opportunities to change direction. Social perceptions further shape vocational tracking. Vocational pathways are more attractive where qualifications lead to recognized occupations, favorable employment outcomes, and access to higher education. Conversely, vocational education may remain a second-choice route where university education is regarded as the principal path to upward mobility. Evidence from China shows how differences in program quality and labor-market returns can reinforce vocational disadvantage (Dai & Martins, 2024; Guo & Wang, 2020; Liu et al., 2024; Wang & Wang, 2023). South Korea has also invested in specialized vocational schools while continuing to face strong demand for university education (Jones & Beom, 2022; Lee, 2018; OECD, 2023d). Public confidence therefore depends on demonstrable quality, credible qualifications, employment returns, and progression opportunities rather than promotional campaigns alone.

Governance emerged as a critical mediating factor. Shared and state-led systems can both perform effectively when responsibilities are clear and coordination is sustained. Governance determines whether curricula are updated, teachers receive professional development, workplace learning is monitored, qualifications are recognized, and labor-market information informs educational planning (OECD, 2023a, 2025a; WB, 2023). Weak coordination can produce fragmented provision, inconsistent employer participation, and qualifications with limited labor-market value. Vocational education should therefore be treated as a collective institutional responsibility rather than solely as a function of schools or government ministries. Career guidance and pathway permeability are equally important. Effective guidance combines counseling, self-exploration, workplace exposure, and labor-market information instead of relying only on examinations or family expectations (Antelm-Lanzat et al., 2020; Fitzpatrick & Costantini, 2022; Kettunen, 2024; Kettunen et al., 2023; Thomsen et al., 2024). This approach is particularly important before students complete lower secondary education because pathway decisions may have long-term consequences for further study and employment. Permeability allows students to revise earlier decisions through credit transfer, recognition of prior learning, bridging programs, re-entry arrangements, and access to higher education. Such mechanisms reduce the risks associated with early differentiation and acknowledge that abilities, interests, and occupational aspirations may change over time (OECD, 2025b; Schmees et al., 2025; UNESCO, 2018). Together, career guidance and flexible progression align vocational education with lifelong learning and help prevent initial placement from becoming a permanent educational ceiling.

The findings consequently suggest that educational equity does not necessarily require the complete elimination of differentiated pathways. Instead, equity depends on the quality and status of vocational programs, the fairness of selection, and the accessibility of transfer and progression opportunities. Systems that provide high-quality vocational education, recognized qualifications, and second-chance pathways can reduce the negative effects of

tracking while retaining occupationally relevant learning. Conversely, even formally flexible systems may reproduce inequality when progression procedures are complex or when disadvantaged students lack information and support (Biewen & Thiele, 2020; Schindler et al., 2024).

For Vietnam, reforms should not focus primarily on importing one foreign model or increasing vocational enrolment targets. Policy learning should emphasize stronger coordination, meaningful employer participation, career guidance before Grade 9 completion, modern curricula, high-quality workplace learning, recognized qualifications, and clear progression routes. Reforms must also address regional inequality, institutional capacity, public perceptions, and limited enterprise participation in training (GIZ & BIBB, 2023; Ho et al., 2023; Kataoka et al., 2020; Le et al., 2020; OECD, 2020; PMV, 2018; WB, 2023). International experience should therefore support context-sensitive adaptation rather than direct policy replication. Policies that function effectively in countries with strong employer organizations, mature apprenticeship traditions, or extensive institutional resources may not produce equivalent outcomes when transferred without modification. Vietnam should selectively adapt international principles to its governance capacity, economic structure, regional diversity, and educational culture (Phillips & Ochs, 2004; Phillips & Schweisfurth, 2014).

6. POLICY RECOMMENDATIONS

Vietnam should clarify coordination among the Ministry of Education and Training, provincial authorities, general schools, vocational institutions, employers, and industry associations. Responsibilities for career education, curriculum development, qualification standards, teacher preparation, quality assurance, and workforce planning should be explicitly assigned. National and sectoral skills councils with employer representation could provide labor-market intelligence and review occupational standards. Comparative evidence shows that both shared-governance and state-led systems can perform effectively when responsibilities are clear and coordination is sustained (GIZ & BIBB, 2023; OECD, 2023a, 2025a; WB, 2023). Employer participation should extend beyond short internships. Enterprises should contribute systematically to curriculum design, occupational standards, workplace training, assessment, teacher industry placements, equipment provision, and graduate recruitment. Germany and Switzerland demonstrate that sustained employer involvement strengthens qualification credibility and school-to-work transitions because training reflects recognized occupational requirements (Bolli et al., 2021; CEDEFOP, 2024b; Eichhorst et al., 2015; Hanushek et al., 2017). Vietnam could encourage participation through co-financing, tax incentives, training contracts, and minimum standards for workplace learning. Partnerships should be long term and sector based.

Career education should become a continuous component of lower secondary schooling, particularly before Grade 9 completion. Guidance should combine self-assessment, counseling, labor-market information, workplace visits, work experience, and clear explanations of academic and vocational routes. Students and families need accurate information about qualifications, employment prospects, and further-study opportunities. Evidence indicates that informed choices are more likely when guidance connects learners' interests and capabilities with realistic educational and occupational options (Antelm-Lanzat et al., 2020; Kettunen, 2024; Kettunen et al., 2023; PMV, 2018; Thomsen et al., 2024). Guidance should support decision-making rather than merely direct lower-performing students toward vocational education. Vietnam should create clearer articulation among vocational schools, colleges, universities, and continuing-education providers. Credit transfer, recognition of prior learning, modular qualifications, bridging programs, and vocational-to-

higher-education routes would reduce the risk that initial placement becomes a permanent educational ceiling. International evidence shows that second-chance arrangements and permeable qualifications can reduce the consequences of early tracking and increase the attractiveness of vocational pathways (OECD, 2024b, 2025b; Schmees et al., 2025; UNESCO, 2018). These routes must be transparent, affordable, and accessible in practice.

Increasing vocational enrolment should be accompanied by substantial quality improvement. Investment is needed in competency-based curricula, modern facilities, digital infrastructure, teacher professional development, student support, and graduate employment services. Curricula should combine occupational competencies with general knowledge, digital literacy, communication, teamwork, problem-solving, and adaptability. This balance is necessary because narrowly specialized training may support initial employment but become less valuable as technologies and occupations change (ADB, 2021; Hanushek et al., 2017; OECD, 2023a; UNESCO, 2021; Wheelahan, 2015). Teachers should receive industry placements to keep instruction aligned with current workplace standards. Program planning should be connected to Vietnam's industrial modernization, digital transformation, green growth, healthcare, logistics, and advanced manufacturing priorities. Labor-market forecasting, employer consultation, graduate-tracer studies, and regional skills assessments should guide the opening, revision, or closure of programs. Institutions should avoid expanding fields with weak demand. Stronger links between vocational planning and economic development would reduce mismatches between qualifications and jobs (GIZ & BIBB, 2023; ILO, 2022a; Kataoka et al., 2020; OECD, 2023b).

Improving the status of vocational education requires demonstrable quality rather than communication campaigns alone. Public confidence is more likely to rise when qualifications lead to stable employment, recognized occupations, and credible progression to higher education. Graduate outcome data should be published transparently, and successful vocational careers should be highlighted without presenting vocational education as suitable only for lower-achieving students (Guo & Wang, 2020; Liu et al., 2024; Sevilla & Polesel, 2022; Wang & Wang, 2023). Finally, vocational education should be embedded within a lifelong-learning system that allows adults to re-enter education, update qualifications, and receive recognition for competencies acquired through employment or previous study. Flexible adult provision, modular credentials, and continuing professional development would strengthen workforce resilience and adaptation to technological and economic change (OECD, 2021, 2023a; SSG, 2023; UNESCO, 2021). Collectively, these recommendations provide an integrated framework for improving governance, employer engagement, career guidance, permeability, training quality, labor-market responsiveness, social equity, and lifelong learning in Vietnam.

7. CONCLUSIONS

This study examined international models of student tracking into vocational pathways after lower secondary education to identify lessons for Vietnam. Through a qualitative comparative literature review and policy analysis, it compared systems in Germany, Switzerland, Singapore, South Korea, China, Japan, Finland, and Australia. Although no model can be transferred directly because vocational systems reflect distinct historical, institutional, economic, and cultural contexts, successful systems share several principles: strong employer engagement, comprehensive career guidance, flexible pathways, positive recognition of vocational education, and progression to further learning. These characteristics improve curriculum relevance, strengthen school-to-work transitions, and support lifelong educational mobility. The findings demonstrate that tracking is not merely the allocation of students between academic and vocational routes, but an integrated system involving

governance, skill formation, labor-market coordination, equity, and lifelong learning. They also highlight the need to balance human-capital development with concerns about social inequality. For Vietnam, priorities include stronger governance coordination, sustained school–industry partnerships, improved career guidance, recognized qualifications, credit transfer, prior-learning recognition, and accessible progression routes. International principles should therefore be adapted carefully to Vietnam's institutional capacity, labor market, and educational culture.

8. LIMITATIONS AND FUTURE RESEARCH

This study relies exclusively on peer-reviewed literature, policy reports, and official documents; consequently, it reflects documented policies rather than the experiences of students, parents, teachers, employers, and policymakers. Its qualitative comparative design identifies institutional patterns but cannot establish causal relationships between tracking policies and educational or labor-market outcomes. Moreover, the selected countries differ substantially from Vietnam, so their experiences should be treated as adaptable principles rather than directly transferable models. Financing, teacher development, regional inequality, digital transformation, and inclusion also remained beyond the study's scope. Future research should examine stakeholder perspectives through interviews, focus groups, and surveys and combine comparative policy analysis with quantitative and longitudinal methods. Further studies should assess how tracking influences achievement, employment, social mobility, and progression to higher education. Research should also investigate career guidance, workplace learning, school–industry partnerships, digital technologies, artificial intelligence, green skills, and teacher preparation. These priorities would support more responsive, equitable, and evidence-based vocational education reform in Vietnam.

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Transparency: The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

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REFERENCES

Antelm-Lanzat, A. M., Gil, A. J., Cacheiro-González, M. L., Pérez-Navío, E., & Fonseca-Pedrero, E. (2020). Learning styles and vocational guidance in secondary education. *Educational Sciences: Theory and Practice, 20*(3), 1-15. http://dx.doi.org/10.12738/jestp.2020.3.001

Anyamene, A. N., & Ngwakwe, C. C. (2020). The role of vocational guidance and counselling in enhancing sustainable development among secondary school students in Nigeria. *Journal of Guidance and Counselling Studies, 4*(1), 1-13. Retrieved from https://journals.unizik.edu.ng/jgcs/article/view/3128

Asian Development Bank (ADB). (2021). *Innovative strategies in technical and vocational education and training for accelerated human resource development in South Asia and East Asia*. Retrieved from https://www.adb.org/publications/innovative-strategies-tvet

Becker, G. S. (1993). *Human capital: A theoretical and empirical analysis, with special reference to education*. University of Chicago Press. https://doi.org/10.7208/chicago/9780226041223.001.0001

Biewen, M., & Thiele, M. (2020). Early tracking, academic vs. vocational training, and the value of "second-chance" options. *Labour Economics, 66*, Article 101900. https://doi.org/10.1016/j.labeco.2020.101900

Birkelund, J. F., Karlson, K. B., & Reimer, D. (2021). Upper secondary school tracking, labour market outcomes and intergenerational inequality in Denmark. *Longitudinal and Life Course Studies, 12*(3), 279–298. https://doi.org/10.1332/175795921X16124376408552

Blommaert, L., Muja, A., Gesthuizen, M., & Wolbers, M. H. J. (2020). The vocational specificity of educational systems and youth labour market integration: A literature review and meta-analysis. *European Sociological Review, 36*(5), 720-740. https://doi.org/10.1093/esr/jcaa017

Bolli, T., Oswald-Egg, M. E., Rageth, L., & Wörter, M. (2021). Meeting the demand for vocational skills? Employer-sponsored training and apprenticeship systems in Switzerland. *Empirical Research in Vocational Education and Training, 13*(1), 1-24. https://doi.org/10.1186/s40461-021-00109-8

Bourdieu, P., & Passeron, J.-C. (1990). *Reproduction in education, society and culture* (2nd ed.). Sage. Retrieved from https://us.sagepub.com/en-us/nam/reproduction-in-education-society-and-culture/book204128

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77-101. https://doi.org/10.1191/1478088706qp063oa

Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). Sage.

Dai, L., & Martins, P. S. (2024). Does vocational education pay off in China? Evidence from city-level education supply shocks. *Economic Modelling, 140*, Article 106863. https://doi.org/10.1016/j.econmod.2024.106863

Eichhorst, W., Rodríguez-Planas, N., Schmidl, R., & Zimmermann, K. F. (2015). A road map to vocational education and training in industrialized countries. *ILR Review, 68*(2), 314-337. https://doi.org/10.1177/0019793914564963

European Centre for the Development of Vocational Training (CEDEFOP). (2023). *Vocational education and training in Europe: Austria*. Retrieved from https://www.cedefop.europa.eu/en/tools/vet-in-europe/systems/austria

European Centre for the Development of Vocational Training (CEDEFOP). rE(2024a). *Vocational education and training in Europe*. Retrieved from https://www.cedefop.europa.eu/en/tools/vet-in-europe

European Centre for the Development of Vocational Training (CEDEFOP). (2024b). *Vocational education and training in Europe: Germany*. Retrieved from https://www.cedefop.europa.eu/en/tools/vet-in-europe/systems/germany-u3

Finnish National Agency for Education (EDUFI). (2024). *Vocational education and training in Finland*. Retrieved from https://www.oph.fi/en/education-system/vocational-education-and-training

Fitzpatrick, C., & Costantini, K. (2022). *Counseling 21st century students for optimal college and career readiness: A 9th–12th grade curriculum*. Routledge. https://doi.org/10.4324/9781003096740

Forster, A. G., Bol, T., & van de Werfhorst, H. G. (2016). Vocational education and employment over the life cycle. *Sociological Science, 3*, 473-494. https://doi.org/10.15195/v3.a21

Gamoran, A. (2010). Tracking and inequality: New directions for research and practice. In M. W. Apple, S. J. Ball, & L. A. Gandin (Eds.), *The Routledge International Handbook of the Sociology of Education* (pp. 213-228). Routledge. https://doi.org/10.4324/9780203863701

German Agency for International Cooperation (GIZ), & Federal Institute for Vocational Education and Training (BIBB). (2023). *Viet Nam vocational education and training report 2021*. Retrieved from https://www.tvet-vietnam.org/wp-content/uploads/2024/02/240227-TVET-Report-2021-Final-version-EN.pdf

Guo, D., & Wang, A. (2020). Is vocational education a good alternative to low-performing students in China? *International Journal of Educational Development, 75*, Article 102187. https://doi.org/10.1016/j.ijedudev.2020.102187

Hanushek, E. A., & Wößmann, L. (2006). Does educational tracking affect performance and inequality? Differences-in-differences evidence across countries. *The Economic Journal, 116*(510), C63–C76. https://doi.org/10.1111/j.1468-0297.2006.01076.x

Hanushek, E. A., Schwerdt, G., Woessmann, L., & Zhang, L. (2017). General education, vocational education, and labor-market outcomes over the life cycle. *Journal of Human Resources, 52*(1), 48–87. https://doi.org/10.3368/jhr.52.1.0415-7074R

Ho, J., & Lee, Y. J. (2022). Primary and secondary education in Singapore: Bringing out the best in every learner. In *Education in Singapore: People-making and nation-building* (pp. 49–68). Springer. https://doi.org/10.1007/978-981-16-9982-5_4

Ho, V. T., & Le, T. Y. T. (2025). The current management of experiential and career guidance activities for lower secondary school students in Dong Xoai City, Binh Phuoc Province.

Dong Thap University Journal of Science, *14*(03S), 123-132. https://doi.org/10.52714/dthu.14.03S.2025.1621

Ho, V.-T., Tran, H.-H., Nguyen, V.-D., & Nguyen, V.-T. (2023). Investigating and implementing a student vocational education model for educational innovation. *Journal of Education and E-Learning Research, 10*(2), 194-200. https://doi.org/10.20448/jeelr.v10i2.4516

Hoeckel, K., Field, S., & Grubb, W. (2009). *OECD reviews of vocational education and training: A learning for jobs review of Switzerland 2009*. OECD Publishing. https://doi.org/10.1787/9789264113985-en

Holland, J. L. (1997). *Making vocational choices: A theory of vocational personalities and work environments* (3rd ed.). Psychological Assessment Resources. https://doi.org/10.4324/9781315782522

Huynh, M. T., Tran, T. H. L., & Vu, T. D. C. (2026). Current experiential and career guidance activities in lower secondary schools in Tam Hiep Ward, Dong Nai City. *Dong Thap University Journal of Science*, *15*(03S), 64-72. https://doi.org/10.52714/dthu.sch.3447.1968

Huynh, N. H., & Le, H. C. (2025). Currently managing career guidance activities for students in secondary schools in Can Duoc district, Long An province. *Dong Thap University Journal of Science*, *13*(04S), 13-26. https://doi.org/10.52714/dthu.13.04S.2024.1441

Institute of Technical Education (ITE). (2023). *Annual report 2022/2023: ITE 30 ready for more*. Retrieved from https://www.ite.edu.sg/docs/default-source/publications/ite-annual-report-2022_compressed.pdf?sfvrsn=ec13a2b6_12

International Labour Organization (ILO). (2022a). *Labour and social trends in Viet Nam 2021: Outlook to 2030*. Retrieved from https://www.ilo.org/sites/default/files/wcmsp5/groups/public/%40asia/%40ro-bangkok/%40ilo-hanoi/documents/publication/wcms_837244.pdf

International Labour Organization (ILO). (2022b). *Global employment trends for youth 2022: Investing in transforming futures for young people*. Retrieved from https://www.ilo.org/global/research/global-reports/youth

Jones, R. S., & Beom, J. (2022). *Policies to increase youth employment in Korea* (OECD Economics Department Working Papers No. 1740). OECD Publishing. Retrieved from https://one.oecd.org/document/ECO/WKP(2022)41/en/pdf

Juwitasari, R. (2024). Technical and vocational education and training toward sustainable development of Japan's aid effectiveness for industrial human resource development in Lower Mekong Basin countries. *IOP Conference Series: Earth and Environmental Science, 1306*(1), Article 012032. https://doi.org/10.1088/1755-1315/1306/1/012032

Kataoka, S., Vinh, L. A., Kitchlu, S., & Inoue, K. (2020). *Vietnam's human capital: Education success and future challenges*. World Bank. Retrieved from https://documents1.worldbank.org/curated/en/261401596433155112/pdf/Vietnam-s-Human-Capital-Education-Success-and-Future-Challenges.pdf

Kettunen, J. (2024). Finnish lower secondary career education through a systems lens. *Nordic Journal of Transitions, Careers and Guidance, 5*(1), 73-85. https://doi.org/10.16993/njtcg.85

Kettunen, J., Skovhus, R. B., Røise, P., Rosvall, P.-Å., Einarsdóttir, A., & Beigi, M. (2023).

Work experience placements in lower secondary education in Nordic countries. *Nordic Journal of Transitions, Careers and Guidance, 4*(1), 29-42. https://doi.org/10.16993/njtcg.60

Kohlmeier, M., & Fischer-Neumann, M. (2024). Upward track mobility into academic upper secondary education: Effects of challenging parental expectations, immigrant origin, and older siblings on students' educational choices. *Research in Social Stratification and Mobility, 90*, Article 100892. https://doi.org/10.1016/j.rssm.2024.100892

Le, D.-H., Tran-Thi, T.-T., Cao, X.-H., & Giang, T.-V. (2020). A pilot result on applying the vocational school-based program for Vietnamese high school students based on a new individual guidance approach. *European Journal of Educational Research, 9*(3), 1337-1346. https://doi.org/10.12973/eu-jer.9.3.1337

Lee, J. (2018). The evolution of vocational education and training in South Korea. *International Journal for Research in Vocational Education and Training, 5*(2), 103-121. https://doi.org/10.13152/IJRVET.5.2.2

Lee, Y. J., & Ho, J. (2022). Basic education in Singapore. In *International handbook on education in Southeast Asia* (pp. 121–140). Springer.

Legislative Council Secretariat (LCS). (2022). *Vocational and professional education in Germany and Singapore*. Retrieved from https://app7.legco.gov.hk/rpdb/en/uploads/2022/IN/IN01_2022_20220624_en.pdf

Liu, H., Xu, Y., Zhang, R., Nie, J., Rule, A., Rozelle, S., & Yuan, L. (2024). Comparing the payoff to vocational and academic secondary education in China over time. *International Journal of Educational Development, 107*, Article 103038. https://doi.org/10.1016/j.ijedudev.2024.103038

Merino, R., Valls, O., & Sánchez-Gelabert, A. (2021). Comprehensive school and vocational training in Spain: A longitudinal approach from the transition from lower to upper secondary education. *Education Sciences, 11*(3), Article 101. https://doi.org/10.3390/educsci11030101

Ministry of Education of the People's Republic of China (MOE China). (2022). *Vocational Education Law of the People's Republic of China*. Retrieved from http://en.moe.gov.cn/documents/laws_policies/

Ministry of Education, Culture, Sports, Science and Technology (Japan) (MEXT). (2023). *The Fourth Basic Plan for the Promotion of Education*. Retrieved from https://www.mext.go.jp/content/20240228-soseisk02-100000597_09.pdf

Ministry of Education, Republic of Korea (MOE Korea). (2023a). *Secondary vocational education policy*. Retrieved from https://english.moe.go.kr

Ministry of Education, Republic of Korea (MOE Korea). (2023b). *Secondary vocational education takes another leap forward*. Retrieved from https://english.moe.go.kr/boardCnts/view.do?boardID=254&boardSeq=96798

Ministry of Education, Singapore (MOE Singapore). (2023a). *Education and Career Guidance*. https://www.moe.gov.sg/education-in-sg/our-programmes/education-and-career-guidance

Ministry of Education, Singapore (MOE Singapore). (2023b). *Learn for life: Our education system*. Retrieved from https://www.moe.gov.sg/education

National Centre for Vocational Education Research (NCVER). (2024). *VET in Schools 2023*. Retrieved from https://www.ncver.edu.au/research-and-statistics/publications/all-publications/vet-in-schools-2023

National People's Congress of the People's Republic of China (NPC). (2022). *Vocational Education Law of the People's Republic of China (Revised 2022)*. Retrieved from https://www.npc.gov.cn/englishnpc/c23934/202204/

Nguyen, T. T. H. (2025). The current situation of managing career orientation education activities for 9th graders in Bac Lieu city, Bac Lieu province. *Dong Thap University Journal of Science*, *13*(04S), 140-149. https://doi.org/10.52714/dthu.13.04S.2024.1454

Nguyen, V. D., Cao, H. E., & Le, V. H. (2026). The current situation of managing vocational orientation education activities for high school students in Hoa Hung Commune, An Giang Province. *Dong Thap University Journal of Science*, *15*(01S), 1-11. https://doi.org/10.52714/dthu.15.01S.2026.1763

Novak, J., Oehrtman, J. P., & Vostal, M. (2024). School counselors' role in supporting college and career readiness: Does disability status matter? *Professional School Counseling, 28*(1). https://doi.org/10.1177/2156759X231225237

Oakes, J., & Guiton, G. (1995). Matchmaking: The dynamics of high school tracking decisions. *American Educational Research Journal, 32*(1), 3–33. https://doi.org/10.3102/00028312032001003

Organisation for Economic Co-operation and Development (OECD). (2020). *Multi-dimensional review of Viet Nam: Towards an integrated, transparent and sustainable economy*. https://doi.org/10.1787/367b585c-en

Organisation for Economic Co-operation and Development (OECD). (2021). *Career guidance for adults in a changing world of work*. OECD Publishing. https://doi.org/10.1787/9a94bfad-en

Organisation for Economic Co-operation and Development (OECD). (2023a). *Building future-ready vocational education and training systems*. https://doi.org/10.1787/28551a79-en

Organisation for Economic Co-operation and Development (OECD). (2023b). *Spotlight on vocational education and training: Findings from Education at a Glance 2023*. OECD Publishing. https://doi.org/10.1787/acff263d-en

Organisation for Economic Co-operation and Development (OECD). (2023c). *The design of upper secondary education across OECD countries: Managing choice, coherence and specialisation*. https://www.oecd.org/content/dam/oecd/en/publications/reports/2023/04/the-design-of-upper-secondary-education-across-oecd-countries_af9a439a/158101f0-en.pdf

Organisation for Economic Co-operation and Development (OECD). (2023d). *Education at a glance 2023: Korea country note*. Retrieved from https://gpseducation.oecd.org/Content/EAGCountryNotes/EAG2023_CN_KOR_pdf.pdf

Organisation for Economic Co-operation and Development (OECD). (2024a). *Education at a glance 2024: Japan country note*. Retrieved from https://www.oecd.org/content/dam/oecd/en/publications/reports/2024/09/education-at-a-glance-2024-country-notes_532eb29d/japan_fb7f8db2/6ec65d8b-en.pdf

Organisation for Economic Co-operation and Development (OECD). (2024b). *What shapes*

upper secondary pathways and transitions? Retrieved from https://www.oecd.org/education/what-shapes-upper-secondary-pathways-and-transitions.htm

Organisation for Economic Co-operation and Development (OECD). (2025a). *Vocational education and training systems in nine countries*. OECD Publishing. https://doi.org/10.1787/1a86eb6c-en

Organisation for Economic Co-operation and Development (OECD). (2025b). *What shapes pathways and transitions?* Retrieved from https://www.oecd.org/content/dam/oecd/en/publications/reports/2025/02/what-shapes-pathways-and-transitions_f3ecc7b7/3e5d83a1-en.pdf

Organisation for Economic Co-operation and Development (OECD). (2025c). *Transitions through education and into the labour market*. Retrieved from https://www.oecd.org/content/dam/oecd/en/publications/reports/2025/01/transitions-through-education-and-into-the-labour-market_d7e7565e/18be3c52-en.pdf

Oterhals, G., Bachmann, K. E., Bjerke, A. H., & Pedersen, A. V. (2023). The relative age effect shifts students' choice of educational track even within a school system promoting equal opportunities. *Frontiers in Psychology, 13*, Article 1066264. https://doi.org/10.3389/fpsyg.2022.1066264

Ozer, M., & Perc, M. (2020). Dreams and realities of school tracking and vocational education. *Humanities and Social Sciences Communications, 6*, Article 34. https://doi.org/10.1057/s41599-020-0409-4

Parajuli, D., Vo, D. K., Salmi, J., & Tran, N. T. A. (2020). *Improving the performance of higher education in Vietnam: Strategic priorities and policy options*. World Bank. Retrieved from https://documents.worldbank.org/en/publication/documents-reports/documentdetail/347431588175259657

Perico e Santos, A. V. (2023). Managing student transitions into upper secondary pathways (OECD Education Working Papers No. 289). OECD Publishing. https://doi.org/10.1787/663d6f7b-en

Phillips, D., & Ochs, K. (2004). Researching policy borrowing: Some methodological challenges in comparative education. *British Educational Research Journal, 30*(6), 773–784. https://doi.org/10.1080/0141192042000279495

Phillips, D., & Schweisfurth, M. (2014). *Comparative and international education: An introduction to theory, method, and practice* (2nd ed.). Bloomsbury Academic. Retrieved from https://www.bloomsbury.com/uk/comparative-and-international-education-9781472523075/

Prime Minister of Vietnam (PMV). (2018). *Decision No. 522/QĐ-TTg approving the project on career education and orientation for student streaming in general education for the period 2018-2025*. Retrieved from https://vanban.chinhphu.vn/?docid=193710&pageid=27160

Schindler, S., Bar-Haim, Y., Barone, C., Birkelund, J. F., Boliver, V., Capsada-Munsech, Q., Erola, J., Facchini, M., Feniger, Y., Heiskala, L., Herbaut, E., Ichou, M., Karlson, K. B., Kleinert, C., Reimer, D., Traini, C., Triventi, M., & Vallet, L.-A. (2024). Educational tracking and social inequalities in long-term labor market outcomes: Six countries in comparison. *International Journal of Comparative Sociology, 65*(1), 39-62. https://doi.org/10.1177/00207152231151390

Schmees, J. K., Smeplass, E., Skålholt, A., Hovdhaugen, E., & Imdorf, C. (2025). Pathways to higher education for vocationally qualified students: The case of Norway. *Nordic Journal of Studies in Educational Policy, 11*(1), 93-106. https://doi.org/10.1080/20020317.2024.2384165

Sevilla, M. P., & Polesel, J. (2022). Vocational education and social inequalities in within- and between-school curriculum tracking. *Compare: A Journal of Comparative and International Education, 52*(4), 581-599. https://doi.org/10.1080/03057925.2020.1798214

Shavit, Y., & Müller, W. (2000). Vocational secondary education, tracking, and social stratification. In M. T. Hallinan (Ed.), *Handbook of the sociology of education* (pp. 437-452). Springer. https://doi.org/10.1007/0-387-36424-2_20

SkillsFuture Singapore (SSG). (2023). *About SkillsFuture*. https://www.skillsfuture.gov.sg

Snyder, H. (2019). Literature review as a research methodology: An overview and guidelines. *Journal of Business Research, 104*, 333–339. https://doi.org/10.1016/j.jbusres.2019.07.039

Standing Conference of the Ministers of Education and Cultural Affairs of the Länder in the Federal Republic of Germany (KMK). (2025a). *Educational paths and qualifications*. Retrieved from https://www.kmk.org/en/bildungsministerkonferenz/bildungsthemen/educational-paths-and-qualifications.html

Standing Conference of the Ministers of Education and Cultural Affairs of the Länder in the Federal Republic of Germany (KMK). (2025b). *Secondary education*. Retrieved from https://www.kmk.org/fileadmin/Dateien/pdf/Eurydice/EN/secondary_education.pdf

State Secretariat for Education, Research and Innovation (SERI). (2025a). *Vocational education and training at a glance*. Retrieved from https://www.berufsbildung-schweiz.ch/en/vocational-education-and-training-at-a-glance

State Secretariat for Education, Research and Innovation (SERI). (2025b). *Vocational education and training in Switzerland*. Retrieved from https://www.sbfi.admin.ch/sbfi/en/home/education/v-p-c-e.html

Stronati, C. (2023). The design of upper secondary education across OECD countries: Managing choice, coherence and specialisation (OECD Education Working Papers No. 288). OECD Publishing. https://doi.org/10.1787/158101f0-en

Tarabini, A., Curran, M., & Castejón, A. (2022). Ability as legitimation of tracking: Teachers' representations of students in vocational and academic tracks. *British Educational Research Journal, 48*(6), 1049–1064. https://doi.org/10.1002/berj.3808

Thomsen, R., Tybjerg, G. M., & Skovhus, R. B. (2024). Career education in the final years of compulsory school in Denmark. *Nordic Journal of Transitions, Careers and Guidance, 5*(1), 15–30. https://doi.org/10.16993/njtcg.84

Tran, P. H., Pham, M. G., & Pham, H. N. (2024). Current status of teachers implementing career education for high school students in the Mekong Delta under the 2018 General Education Program. *Dong Thap University Journal of Science*, *13*(01S), 227-238. https://doi.org/10.52714/dthu.13.01S.2024.1316

Tran, T. M. T., & Pham, M. G. (2026). Current situation of managing career guidance activities for students at Chi Lang Lower Secondary School in Khanh Hoi Ward, Ho Chi Minh

City. *Dong Thap University Journal of Science*, *15*(02S), 122-135. https://doi.org/10.52714/dthu.sch.3255.1927

UNESCO International Centre for Technical and Vocational Education and Training (UNESCO-UNEVOC). (2021). *TVET country profile: Singapore*. UNESCO-UNEVOC. Retrieved from https://unevoc.unesco.org/home/Dynamic+TVET+Country+Profiles

United Nations Educational, Scientific and Cultural Organization (UNESCO). (2018). *Pathways of progression: Linking technical and vocational education and training with higher education*. UNESCO. Retrieved from https://unesdoc.unesco.org/ark:/48223/pf0000265943

United Nations Educational, Scientific and Cultural Organization (UNESCO). (2021). *UNESCO strategy for technical and vocational education and training (TVET) (2022-2029).* Retrieved from https://unesdoc.unesco.org/ark:/48223/pf0000380727

Varaprasad, N. (2024). Vocational education and training in Singapore. In L. P. Symaco & M. Hayden (Eds.), *International handbook on education in Southeast Asia*. *Springer International Handbooks of Education*. Springer. https://doi.org/10.1007/978-981-16-8136-3_10-2

Wang, G., & Wang, Z. (2023). Vocational education: A poor second choice? A comparison of the labour market outcomes of academic and vocational graduates in China. *Oxford Review of Education, 49*, 408–427. https://doi.org/10.1080/03054985.2022.2096583

Wheelahan, L. (2015). Not just skills: What a focus on knowledge means for vocational education. *Journal of Curriculum Studies, 47*(6), 750-762. https://doi.org/10.1080/00220272.2015.1089942

World Bank (WB), United Nations Educational, Scientific and Cultural Organization (UNESCO), & International Labour Organization (ILO). (2023). *Building better formal TVET systems: Principles and practice in low- and middle-income countries*. Retrieved from https://unesdoc.unesco.org/ark:/48223/pf0000386135

World Bank (WB). (2019). *World Development Report 2019: The changing nature of work*. Retrieved from https://www.worldbank.org/en/publication/wdr2019

World Bank (WB). (2021). *Improving the performance of higher education in Vietnam: Strategic priorities and policy options*. World Bank. Source base: World Bank report. Retrieved from https://documents1.worldbank.org/curated/en/347431588175259657/pdf/Improving-the-Performance-of-Higher-Education-in-Vietnam-Strategic-Priorities-and-Policy-Options.pdf

Zhaina, B., Ospan, S., Elmira, M., Gulnar, K., & Tolganay, B. (2020). Pedagogical Foundations of the Technology of Vocational Guidance for Students. *Journal of Intellectual Disability - Diagnosis and Treatment*, *8*(4), 770-776. https://doi.org/10.6000/2292-2598.2020.08.04.20