

RESEARCH ARTICLE

China-ASEAN Qualifications Framework: Pathways to mutual recognition

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ABSTRACT

Developing a mutual recognition mechanism for China-ASEAN qualification framework of vocational education is essential for creating a fair, freely mobile lifelong learning system that will enable learner to carry and accumulate their learning outcomes across the region. By formulating and implementing unified standards, mutual recognition of qualifications across domains, industries and regions will be promoted, fostering greater collaboration and mobility between educational institutions and workplaces. To achieve this objective, China and the Association of Southeast Asian Nations (ASEAN) have undertaken extensive preparations and explorations at the policy, organizational and functional levels. The development commitments outlined in the “Vision 2030 of China-ASEAN Strategic Partnership” provide a framework for the establishment of a mutual recognition mechanism, while the existing promotion measures of all parties demonstrate their commitment to realizing this vision. This paper proposes the concept of five development stages of mutual recognition of national qualification frameworks (NQFs) in vocational education, which will gradually establish the mutual recognition mechanism of regional NQFs. This mechanism will not only promote greater collaboration and mobility between learners, educational institutions, and workplaces but also achieve the ultimate goal of comprehensive development of people and society in the region.

Keywords: NQF; mutual recognition; vocational education; ASEAN; staged development

1. Introduction

According to United Nations Educational, Scientific and Cultural Organization’s (UNESCO) definition, a national qualifications framework (NQF) is an instrument for the development, classification, and recognition of skills, knowledge, and competencies along a continuum of orderly levels which are finally determined after multiple discussion and judgement. It is a way of structuring existing and new qualifications that are defined by learning outcomes^[1]. The qualification framework refers to the unified integration of

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resultful education and cultivation at all dimensions and levels, including on-campus education and off-campus education, continuing education, and vocational training, to achieve the consistent and coordinated development of education and learning at all levels. This mechanism will build a barrier-free, mobility-free, fair, and lifelong learning system that carries and accumulates learning achievements for regional citizens.

At the same time, the formulation and implementation of unified standards will guarantee and improve the quality of education and training, and various qualifications will be compared, recognized, linked, and combined, promoting mutual recognition of qualifications across fields, industries, regions, and borders^[2]. According to the “Global Inventory of Regional and National Qualifications Frameworks 2019”, 161 countries or regions have established NQFs^[3]. However, China has not yet built a rounded national framework of lifelong learning qualifications, which has affected the establishment of a lifelong education system and the in-depth exchanges between countries to some extent^[4].

In recent years, China has begun to attach great importance to the construction of the NQF. China issued the “Outline of the National Medium and Long-term Education Reform and Development Plan (2010–2020)” in 2010, which proposed sharing high-quality educational resources and promoting the interconnection of educational information. The ideology of integrating all types of education management resources at all levels, building a national public service platform of education management has been proposed^[5]. For the implementation of these policies, it will be necessary to develop a pilot project of a flexible school system and modular teaching in vocational education (VE). As for the pilot of building a lifelong education system and mechanism, this policy makes a more detailed statement: “While coordinating the development of social education resources and actively developing community education, a general education system will be established regionally: (1) A lifelong learning network and service platform; (2) “Credit bank” system; (3) learning achievement certification system, and etc.”^[5]. Since then, China has formulated a series of policies that clearly regard “establishing a national qualifications framework” as an important strategic task^[6,7]. In 2019, “promoting the construction of a qualifications framework” was emphasized in the construction of the national VE system by the “National Vocational Education Reform Implementation Plan”^[8]. In these policies, keywords that appear in association will be listed as “vocational qualifications”, “certificate”, “vocational skill levels”, “credit bank”, “learning outcomes”, etc. In other words, this symbolizes China’s intention to use the “national qualifications framework” as the implementation path, through which personal learning outcomes and the patterns of the relevant manifestations are promoted to the direction of inter-communication and mutual recognition.

Represented by Hong Kong, Guangdong, the National Open University, some regions, or institutions in China have carried out partial pilot projects for the establishment of qualifications frameworks. Guangdong Province promulgated the “Guangdong Lifelong Education Qualifications Framework Grade Standards” in 2017. Subsequently, the formulation of competency standards for the automotive industry, machinery manufacturing, and other industries has been launched, together with the construction of lifelong learning accounts based on credit banks. As an immediate achievement, 12.56 million pieces of learning outcomes have been recorded^[9]. Under the framework of a larger initiative, a visionary cross-regional and cross-system policy experiment for mutual recognition of vocational education qualifications is being implemented in the Greater Bay Area, involving Hong Kong, Macau, and Guangdong^[10]. After the pilot project of the “Academic Certificate + Several Vocational Skill Level Certificates” (1+X Certificate System) was carried out in experimental work in 2019, for realizing the co-construction of learning resources at the school-enterprise level and for accurately connecting graduates with job-hunting positions, this policy has received good feedback in the practice of opening up internships and employment in the region^[11].

China has introduced a number of policies and regulations to create the necessary foundation for the establishment of a skilled society involved in the all-round and free development of individuals. At the same time, based on the principles of common vision, culture of cooperation, sharing mechanism, and atmosphere of consultation^[12], ASEAN has put forward a series of important strategic vision on the qualification framework and established a multi-party cooperation mechanism in VE and vocational teacher education to promote the synchronous development of regional VE^[13,14]. At present, all major economic entities have developed designs or strategic plans for the NQF of VE and have implemented mutual recognition of the qualifications of some courses in the regional scope. The establishment of a China-ASEAN NQF mutual recognition mechanism for VE is not only conducive to obtaining a lifelong learning system for VE learners in the region, but also a platform that is fair and free-movable. The function of the platform is expected to maintain and accumulate learning outcomes. By developing and implementing uniform standards, the mutual recognition mechanism will also facilitate the mutual recognition of qualifications across fields, industries, and regions. At the same time, this mechanism will provide a consistent and authoritative evaluation system, promoting knowledge sharing for high-level VE and technical training needed for economic development and industrial upgrading in the China-ASEAN region.

In the future, achieving mutual recognition of qualifications within the China-ASEAN framework to enhance talent mobility and educational resource sharing, thereby advancing economic development, will require proactive planning and the establishment of a supportive policy environment. Differentiated strategies will be adopted based on the specific circumstances of each country.

2. The development of NQFs

2.1. The development of China's NQF

Since the establishment of the strategic partnership between China and ASEAN in 2003, bilateral cooperation in the field of education has been deepening. Premier Li Keqiang pointed out at the 21st China-ASEAN leaders' meeting that it is necessary to "promote the in-depth docking of 'the Belt and Road' Initiative (BRI) and ASEAN Vision 2025" and "promote the further improvement and upgrading of China-ASEAN Relations"^[15]. At the "Forum on the Internationalization of VE" held in the 2022 China-ASEAN Education Exchange Week in August 2022, Sun Xiaobing, Executive Chairman of the China Association for Education Development Strategy, proposed to carry out institutional innovation in the internationalization of China-ASEAN VE cooperation. The construction of a NQF and mutual recognition mechanism will be the preconditions for the internationalization of VE cooperation. Building a cooperative development system for VE in both domestic and international markets will be meaningful for concerned parties. On the one hand, through the international cooperation and exchange of VE, such as high-quality resources, vocational practitioners, science, and technology, which are urgently needed for regional economic and social development will be introduced and cultivated. On the other hand, the reform and innovation of education concepts, school operation modes, management structures, and corresponding mechanisms will be realized through strengthening the cooperation between the education systems of different countries. China and ASEAN have promoted many educational cooperation projects such as "China-ASEAN Information Technology Talent Training Program", "Intelligent Manufacturing Talent Training Program", "Tourism Vocational Education Cooperation Program" and "Agricultural Talent Training Program" have played a considerable role in the establishment of a talent training system with a long-term mechanism in the ASEAN region and the economic integration and development of the region and the world^[16]. In the process of in-depth participation in international VE exchanges and cooperation, the reform and innovation of China's VE will be continued, and China-ASEAN's VE programs will be provided for the world.

In terms of policy promotion, “The 13th Five Year Plan Outline for National Economic and Social Development of the People’s Republic of China”, issued in 2016, formally incorporated the construction of the NQF into the national development plan. Since then, policy documents have been issued many times to identify the construction of the NQF as an important part of VE reform^[17]. “China’s Education Modernization 2035”, issued in 2019, clearly proposed the strategic task of “establishing an institutional environment for lifelong learning for all and establishing an NQF”. The National Vocational Education Reform Implementation Plan clearly proposes to promote the construction of the qualification framework and explore the interconnection between academic certificates and vocational skill level certificates^[18,19]. In 2020, the Action Plan for Improving the Quality and Excellence of Vocational Education (2020–2023) again emphasized the need to promote the construction of the NQF, and establish a mechanism for identifying, accumulating and transforming the learning outcomes of all levels and types of education and training, which means that in the framework of China’s VE system, issues such as the inspection, transformation, exchange, and accumulation of learning outcomes faced in lifelong education are increasingly considered under the sustainable development strategy^[20]. In 2021, the “Opinions on Promoting the High-Quality Development of Modern Vocational Education” clearly pointed out that by 2025, the characteristics of VE types will be more distinctive, the modern VE system will be basically completed, and the construction of a skilled society will be comprehensively promoted. By 2035, a skilled society will be built, and the overall level of VE will be among the top in the world^[21]. In March 2022, the qualification platform for lifelong VE training was established with reference to the national “credit bank” construction plan and the implementation plan of the “Major Index of the National Profession Classification”^[22,23].

From the policy level, it can be observed that China is exploring the transformation and connection of comprehensive learning contents contained in academic qualification and vocational qualification certifications, and gradually defining the scope and setting up the basis of national standards. It is also trying to establish a service-oriented official platform system covering a wide range of categories, such as “credit banks”, to certify and record the qualifications of learners participating in certification, ensuring that the learning achievements are recordable, searchable, transformable, and movable, laying a good foundation for the further systematic implementation of the national qualification system^[24,25].

At the organizational level, China has attached great importance to establishing a series of governmental, non-governmental, and professional organizations to ensure the development and management of VE in recent years. These include the Department of Vocational Education and Adult Education of the Ministry of Education, the Research Institute of the Vocational and Technical Education Center of the Ministry of Education, and the China Association for Educational Development Strategy. At the local level, there are VE and adult education departments, educational science research institutes, and other departments or institutions in the provincial education departments. Additionally, there are local VE associations or VE training associations under the management of provincial education departments. The Research Institute of the Vocational and Technical Education Center of the Ministry of Education was renamed as the “Vocational Education Development Center of the Ministry of Education” in July 2022. These organizations and institutions participate in the development of important policies, regulations, and strategic plans for VE, organize research on forward-looking, basic, and strategic issues of VE, and play the role of pioneers in the construction of the NQF for VE and regional cooperation.

2.2. Development of qualification frameworks in ASEAN countries

All ASEAN member countries have currently completed the development of their respective NQFs. Among these, Vietnam has established a hybrid qualifications framework based on the recognition and certification of learning outcomes. Singapore has established a qualifications framework for Technical and

Vocational Education and Training (TVET). Thailand’s qualifications framework places a greater emphasis on higher education development. Malaysia, the Philippines, and Myanmar have established comprehensive qualifications frameworks. Both Vietnam and Laos emphasize TVET within their education systems. Overall, ASEAN member countries place significant emphasis on the VE sector within their NQFs (**Table 1**).

Table 1. National qualifications frameworks of ASEAN member states.

Member	Qualification framework	Qualification levels in higher education and vocational education
Malaysia	NQF 8 Levels	Higher education (HEd): Level 3–8/VE: Level 1–5/Skill Training (ST): Level 1–5
Thailand	NQF 9 Levels	HEd: Level 5–9/VE: Level 3–4/Basic education (BE): Level 1–2
Indonesia	NQF 9 Levels	HEd: Level 6–9/Professional education: Level 7–9/TVET: Level 2–6/BE: Level 1–2
Vietnam	NQF 8 Levels	HEd: Level 6–8/VET: Level 1–6/National vocational skill training: Level 1–5
Philippine	NQF 8 Levels	HEd: Level 6–8/VE & Skills development: Level 1–5/BE: Level 1–2
Lao, PDR	NQF 8 Levels	HEd: Level 6–8/VET: Level 1–7/ST: Level 1–6
Brunei	NQF 8 Levels	HEd: Level 5–8/TVET: Level 1–5/School education: Level 2–4
Cambodia	NQF 8 Levels	HEd: Level 6–8/VE & ST: Level 1–8/BE: Level 1–4
Myanmar	NQF 8 Levels	HEd: Level 6–8/TVET: Level 3–5/Vocational skill certificate: Level 1–5/BE: Level 1–3
Singapore	WSQ 7 Levels	VET: Level 1–7

Note: WSQ: Workforce Skill Qualifications.

Source from official websites of Ministry of Education. (Malaysia/Thailand/Myanmar/Singapore/Cambodia/Brunei/Lao, PDR/Philippines/Vietnam/Indonesia).

From the table, it can be observed that Malaysia, Vietnam, Laos, Myanmar, and Indonesia have categorized VE and training as separate domains. Myanmar’s Vocational Skill Certificate, in particular, covers Levels 1–5. This illustrates that ASEAN countries prioritize the development of VE and training as distinct areas. The qualifications framework plays a significant role in shaping the future human resource pool.

2.3. The development of ASEAN vocational education qualification mutual recognition system

At the political level, ASEAN regards the regional development of vocational and technical education as the goal of VE planning, realizes the mutual recognition agreement of qualifications within ASEAN, and formulates a series of guiding steps to ensure the sustainability of regional development of ASEAN vocational and technical education from the highest level of regional intergovernmental education cooperation. The ASEAN Ministers of Economy jointly signed the ASEAN Framework Agreement on Service Industry in 1995, proposing mutual recognition of industry qualifications among member countries for the first time. In 2007, all parties signed the ASEAN Economic Blueprint, calling on all countries to cooperate and mutually recognize their professional qualifications to create an environment for the free movement of technicians. Through the “Asia-Europe Summit and the EU Lifelong Learning Qualifications Framework”, all countries establish an interface mechanism. In cooperation with Australia and New Zealand, which are pioneers in building the qualifications framework, ASEAN countries advocate for the establishment of an education and training management project for the “free trade area” among the three countries, laying a solid foundation for the establishment of a mechanism for mutual recognition of qualifications among nations. In 2014, ASEAN formulated the eight-level “ASEAN Qualifications Reference Framework” (AQRF), which was formed on the basis of analyzing the levels and standards of the existing qualifications frameworks of ASEAN member countries. The national NQFs of ASEAN member states were docked with the AQRF in 2015, and the docking of qualification levels among the main member states was also completed.

At the organizational level, ASEAN has established entities and networks at different dimensions for the

regional development of vocational and technical education. These institutions and networks ensure the smooth implementation of various vocational and technical education agreements. Their important measures include: (1) Establishing “Seameo Voctech”, the vocational and technical education center under the organization of Southeast Asian Ministers of Education, which is the earliest regional VE center and also the coordination center; (2) The Association of Southeast Asian Vocational and Technical Education (SEA-TVET), the interactive network between vocational colleges and industries, has been forged; (3) The Regional Association for Vocational Teacher Education (RAVTE) has been organized. RAVTE is mainly a research think tank for VE teachers, a promoter of relevant policies, and an explorer of new policies.

At the functional level, ASEAN’s path to regional development of VE is to formulate a series of frameworks and plans to increase the consistency and transparency of the ASEAN vocational and technical education system. These frameworks and plans provide technical guarantees for the connection between ASEAN VE systems. For example, the “ASEAN Qualification Reference Framework” (AQRF) provides operational tools for mutual recognition, comparison, interaction, and connection between the education systems of member countries’ vocational and technical education alliances, eliminating barriers to mutual recognition of qualifications at all levels in the region. The regional VE teacher standards and the ASEAN enterprise trainer standards have also been developed. The two sets of standards ensure the quality of VE teachers in the region and make the diverse characteristics comparable^[26]. The high-quality index of regional academic journals is published, which promotes ASEAN research achievements, improves the ranking of universities and technical colleges, and even expands international influence.

ASEAN’s VE cooperation and mutual recognition of qualifications in the region are promoted through the ASEAN Secretariat, research centers related to SEAMEO, the ASEAN Education Ministers’ Organization, the ASEAN Senior Officials’ Education Conference, and other institutions, and outside the region through the EU, the International Labour Organization, and cooperation with China, Germany, New Zealand, and other countries. This cooperation has the characteristics of the non-mandatory ASEAN approach, and the implementation outline of VE and training in the AQRF has been recognized by Cambodia, Laos, Myanmar, Thailand, and Vietnam.

For instance, In the development of VE and training system in Vietnam in line with the ASEAN Qualification Framework (AQRF). The AQRF as a voluntary system is highlighted which emphasizes the recognition of qualifications across ASEAN member states. In their study, The AQRF was well-received by the VE and training community in Vietnam, and it helped to enhance the quality of VE and training programs^[27]. In the implementation of the AQRF for higher education in Vietnam. It is noted that the AQRF is an important tool to facilitate the mobility of students, workers, and professionals across ASEAN member states. However, some challenges have been identified in implementing the AQRF, such as differences in the education systems and standards across ASEAN countries and the necessity to be adjusted to the local context of each member state^[28]. As for the role of the AQRF in developing the NQF (NQF) of member countries. The AQRF levels will enhance trust and confidence in the NQF of member states, facilitating the quality assurance process when referencing NQFs^[29]. Other countries in Southeast Asia also welcome this non-mandatory framework that is tailored to their own circumstances^[30].

Although ASEAN has referred to the successful experience of the Bologna process in Europe in the process of regional development of VE, it has not insisted on establishing a similar highly standardized education system but allowed the harmonious development of ASEAN countries with diversified education practices^[31]. Rodolfo C. Sevrino, former Secretary-General of ASEAN, believes that Southeast Asia is not Western Europe but has taken an informal route of regional supranational mechanism evading legislative forms and commitments and avoiding detailed planning. Therefore, ASEAN’s mutual recognition mechanism of

qualifications shows certain flexibility to some extent. Among the ten ASEAN countries, most countries have a NQF of 8 levels, but Indonesia and Thailand are building a NQF of 9 levels, while Singapore has a labor skills qualification framework of 7 levels. If the QF does not correspond to each other, then several levels in the NQF need to match with one level in the reference framework at the same time.

3. Research methodology

3.1. Systematic analysis framework

Literature analysis is a commonly used research method in the policy field. Researchers can gain an in-depth understanding of various issues and challenges in the policy-making and implementation process and provide valuable references and suggestions for policy-making and implementation^[32,33]. Focusing on the staged goals that need to be addressed for the mutual recognition of NQFs between China and ASEAN, qualitative research methodology is applied in this study. This involves a public collection of 34 official documents and archives sources, as well as analyzing 67 policy documents, conference resolutions, and memoranda (see Appendix A).

The selection criteria are based on iconic documents closely related to mutual recognition and cooperation in vocational education, vocational qualifications certification, and QFs developed by various countries in the past decade, which also include qualifications frameworks from different nations. These policy documents cover education, organization, labor market development, policy initiatives within ASEAN, as well as between China and ASEAN, and significant conference resolutions. Based on the analysis of content themes, the high-frequency themes in these documents include learning outcomes management, transformative educational policies, labor market improvement, supportive complementary policies, system innovation, TVET certification, international cooperation, quality assurance. Even for the same themes, the functions portrayed in the policy documents differ. Overall, ASEAN countries, with Malaysia as a representative, have aligned their relevant policies and management systems in the qualifications framework field with international standards. On the other hand, China emphasizes driving internal flexibility and cooperation, stressing that regions should implement execution details in accordance with unified standards while considering regional disparities.

In order to visually represent the key themes and concepts present in the collected textual data, a word cloud analysis was conducted (**Figure 1**). The word cloud technique is a visual representation method that displays the most frequently occurring words in a given text. In this analysis, the textual data includes official documents related to the establishment of qualifications frameworks and TVET development issued by China and ASEAN education authorities, in order to gain an in-depth understanding of the macro policy tendencies of countries in TVET qualification certification and development from the perspective of qualifications frameworks. The word cloud was generated using the Python Word Cloud library, and the text data were preprocessed to remove common function words and meaningless high-frequency words. The word cloud captures the central ideas and main theme of the texts^[34].

The combined analysis of word frequency and content reveals that China's policies are focused on the pathways for learners to acquire skills, as well as the standards for assessment and certification, indicating a cautious approach by policy makers. The policy planning demonstrates a clear expectation for qualifications frameworks to address talent development, industry demands, and educational innovation. Additionally, terms like cooperation, collaboration, and integration are commonly employed in China's policies, often arising in the deconstruction and reconstruction processes of complex systems.

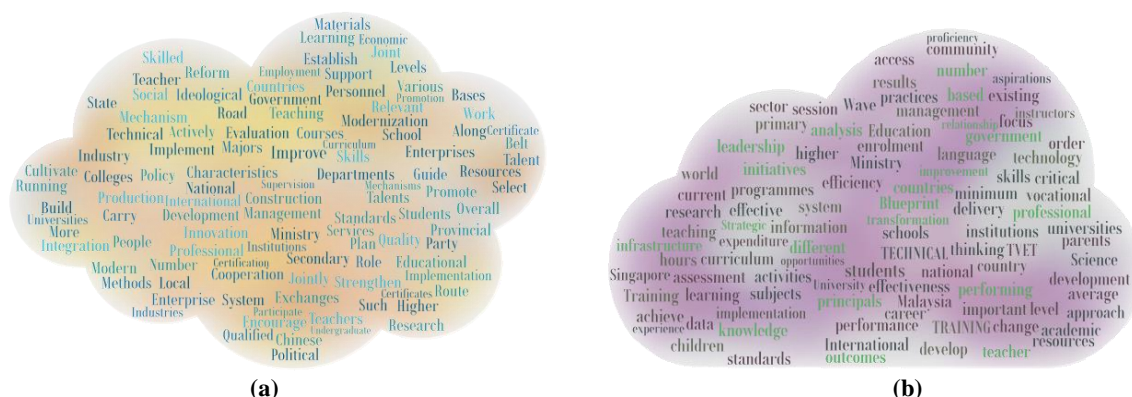


Figure 1. Word Cloud of terms' frequency in policy documents. (a) word cloud 1: China's Policies (File code: GP-C1~C7); (b) word cloud 2: ASEAN's Policies (File code: GP-A1~A5; CM-A1).

In the context of ASEAN, the word cloud primarily revolves around aspects related to professional skills, knowledge, job performance, execution, leadership, and research, which are closely linked to learners' abilities. This is influenced by the fact that all ASEAN member states have established their own qualifications frameworks, resulting in official documents that are more technically and professionally focused. While comparability is limited, two notable points of similarity and difference are worth noting: the shared emphasis on the manifestation of professional skills in learning outcomes, which underscores the fundamental attribute of qualifications framework construction tied to learner development; however, the disparity lies in how ASEAN countries (represented by Malaysia) have taken diligent consideration of the role of stakeholders in promoting student skill development and have embarked on detailed phased implementations, while China's policies remain in the stage of comprehensive depiction and promotion. These differences stem from deeper reasons: on one hand, China faces significant regional disparities in development, necessitating time for consistent institutional construction; on the other hand, building upon the convergence of institutional frameworks, the international community's efforts to promote integration among various national education systems are fundamentally rooted in neoliberalism principles. Against the backdrop of shifting global dynamics, China's primary focus lies in addressing existing institutional challenges through innovative policy approaches.

After encoding and analyzing the content of policy texts, this study identified the following themes in the documents: Learning Outcomes Management, Transformative educational policies, Employment improvement, Alignment with Industries Upgrading, System Innovation, TVET Quality & Certification, International Cooperation, and Supportive Complementary Policies. These policy documents also serve different functions: Responding to change, Encouraging behavior, Providing guidance and support, Normative development, Problem-solving, Safeguarding rights, and Promoting coordination and cooperation (Appendix Table C1).

In terms of learning management, both China and ASEAN mention initiatives and regulations related to the credit management system, indicating that the basic credit system has been widely adopted. Regarding employment, China emphasizes learners' rights protection through relevant learning certifications, and focuses on developing supportive policies to enhance TVET quality. Since ASEAN countries have generally established their own qualification frameworks, the content of ASEAN documents emphasizes the implementation details of the framework and specific guidance on inspection mechanisms, particularly in the solution of actual implementation. On the other hand, China's relevant documents clearly remain at the level of "encouragement". Both sides prioritize policy guidance and themes that promote cooperation. China's policy documents encourage innovation and experimentation in practical applications at the local level. China

places more emphasis than ASEAN on cooperation in employment and involving stakeholders. It is important to note that some ASEAN member countries also attach great importance to improving TVET quality through stakeholder engagement, such as Vietnam, the Philippines, and Thailand.

Based on an analysis of relevant literature and policy documents, this study has identified inter-connected factors in the mechanism of qualification mutual recognition, and applied a systematic analysis approach to examine the key nodes of the process (**Figure 2**).

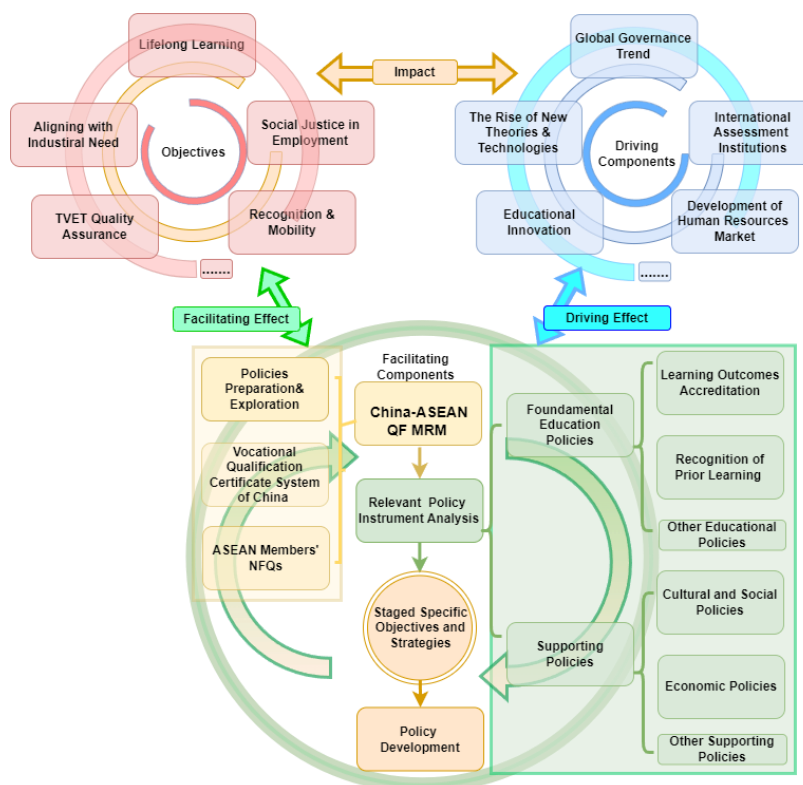


Figure 2. Factors Inter-connected with the development of qualification recognition mechanisms.

Mutual recognition of NQFs is one of the pathways for the alignment of education systems among different countries, and the education system is subject to pressures from both within and outside the system^[35]. In this systematic analysis framework, “Driving Components” circle is composed by the elements such as global governance trend, educational innovation, international assessment institutions, development of human resources market, and the rise of new theories and technologies. Globalization tends to lead to endogenous enforcement of compliance with norms and gives priority to facilitation^[36], A NQF is a crucial foundation for aligning domestic standards and international regulations in the identification of educational attainment and professional certification^[37]. Under the impetus of lifelong learning, educational innovation, and industrial technological upgrading, the improvement and interoperability of NQFs have become driving forces supporting development of mutual recognition mechanism^[38,39]. The objectives encompass lifelong learning, addressing the demands of industrial technological upgrading, ensuring TVET quality assurance, recognizing learning outcomes and promoting the mobility of skilled labor, enhancing social justice, and facilitating employment equity. The refinement and alignment of qualifications framework systems between China and ASEAN can effectively contribute to the achievement of these objectives. This study focuses on the phased developmental strategies of these facilitating factors.

3.2. Grounded theory approach

Two sets of interview question lists were developed based on the analysis results. The first one is for interviewers' viewpoints preparation, containing 15 questions, and the second list includes 8 questions. The data collection for the research was conducted in two phases under the supervision of the Ethics Committee of China National Institute for Educational Research. In the first phase (10/8/2022–30/8/2022), experts were asked to focus on themes identified in the email notifications to prepare background information and viewpoints for in-depth interviews. Example questions included: issues related to qualifications framework development and education quality, identification and recognition of informal learning outcomes, stakeholder promotion of advanced skills training or vocational higher education, technical barriers to qualifications framework mutual recognition, and your expectations for qualifications framework mutual recognition.

In the second phase of the study (1/9/2022–20/9/2022), experts were invited to participate in responsive interviews^[40] (**Table 2**). This type of interview allowed researchers to gain insights into participants' thoughts on the topics through in-depth interactions based on their research and work experiences. Sample questions included: how do you view the achievements your country has made in qualifications framework development, what changes does education bring to learners and how are they identified and documented? What challenges need to be addressed in the process of developing mutual recognition mechanisms? What strategies should be adopted to address potential issues in the direction of qualifications framework alignment? In your opinion, what stages do China and ASEAN need to go through for qualifications framework mutual recognition?

Table 2. Question list of interview.

No.	Category	Question
	Basic information	What is your field of work and research?
1	Background question	How do you view the current achievements in the development of NQFs in Southeast Asia or China?
2	Theoretical question	What changes does education bring to learners, and how are these changes recorded within the qualification framework?
3	In-depth question	What are the driving forces behind the development of qualification framework construction, and where do you see it ultimately heading?
4	In-depth question	What challenges need to be addressed in the process of developing a mutual recognition mechanism for NQFs, and what specific goals are aimed to be achieved?
5	Theoretical question	In your opinion, which aspect of learners' changes and development should NQFs prioritize, and why?
6	Case-study question	Different countries have varying descriptors for learning outcomes and credit systems in their NQFs. Do you think these differences impact the establishment of a mutual recognition mechanism for NQFs?
7	In-depth question	What stages do you believe the mutual recognition of NQFs will go through, and what strategies should be employed to address them?
8	Open-ended question	How do you foresee the future prospects of mutual recognition of NQFs?

Barney Glaser and Anselm Strauss's "The Discovery of Grounded Theory: Strategies for Qualitative Research"^[41] led the charge in defending the quality of qualitative research and developing policy. Using targeted coding can help researchers accelerate the analysis process and streamline subsequent data collection to gather the targeted data for answering questions in iterative analysis. Through the collection and analysis of interview data, we sequentially address significant issues related to the establishment and mutual recognition direction of qualifications frameworks. Through interviews, researchers can gain insights into the participants' perspectives and collect data on their personal experiences and emotions^[42]. This study comparatively analyzed interviewees' perceptions of the nature of NQFs and their development based on existing contexts and explored the prospects of alignment between the two frameworks. Once this study had determined the perspectives of

the participants on the central issue, a mixed approach of thematic analysis and the constant comparison method (CCM) was employed. The CCM integrates four stages: (1) comparing incidents applicable to each category, (2) integrating categories and their properties, (3) defining theory, and (4) writing theory^[40]. The following research findings are presented within the themes coded based on the data.

3.3. Population

This study employed a non-probabilistic sample consisting of policy researchers and HEI educators from China and ASEAN, a total of 12 scholars participated in the study, of whom 10 were male and 2 were female (Appendix Table B1). All participants held doctoral degrees and had extensive experience related to their work in qualifications framework construction, vocational education and training, and China-ASEAN cooperation. Their policy research experience exceeded 10 years. In response to participants' anonymity requests, codes were assigned to each individual. Although the ideal composition of interviewees should include experts from ASEAN member states, from the perspective of the BRI macro policy, the focus was primarily on representative countries within ASEAN that have more established systems in terms of internal qualifications frameworks and TVET certification. This selection provides a sufficient background for exploring cutting-edge cooperation between China and ASEAN. The study has obtained informed consent from the participants.

4. Findings: Staged development design of mutual recognition of China-ASEAN vocational education national qualifications framework

The construction of mutual recognition of China-ASEAN VE qualifications is conducive to the development of bilateral and multilateral educational and training cooperation between China and ASEAN member countries. It is helpful for learners to clearly understand the various connections of learning content under different qualifications. It also promotes continuing education and participants' lifelong learning. This attempt is beneficial for employers to understand the specific qualifications and skills that employees will be expected to have, in order to improve the human resource management of enterprises and give full play to employees' talents. It will help promote the trans-regional mobility of learners and employers, which will further promote the social and economic development of China and ASEAN countries. Although ASEAN member countries are confident in building the AQR, they still face a series of problems that need to be solved in practice. It is necessary to clarify the phased objectives and work contents of NQF construction. As a multi-dimensional system that integrates various TVET fields, it needs the national official departments such as Ministry of Education (MoE) to take the lead in cooperation with multiple departments. According to the principles of international cooperation in vocational and technical education and the practical factors of industrial upgrading, the construction of China's NQF and the China-ASEAN mutual recognition mechanism will be carried out in stages, which requires corresponding strategies to address challenges (**Figure 3**).

4.1. Stage 1 and corresponding strategies

The first stage is to design the basic rules for the formation of the mutual recognition framework of qualifications of China-ASEAN VE. On the premise of the common prospect of China-ASEAN mutual recognition of qualifications, the existing qualification structure design will be modularly deconstructed and restructured to form a standardized, unified, and authoritative professional qualification generation mechanism, in order to set standards for NQFs' mutual recognition, and furthermore establish a mutual recognition mechanism and a quality assurance mechanism. It will even preserve the interface of China-ASEAN mutual recognition while fully considering the standards of ASEAN, Australia, and Europe's mutual recognition agreements of qualifications. Some certification centers will be set up to cultivate a team of certification

standard inspection experts, with a view to standardizing the basis for mutual recognition of qualifications within the China-ASEAN framework.

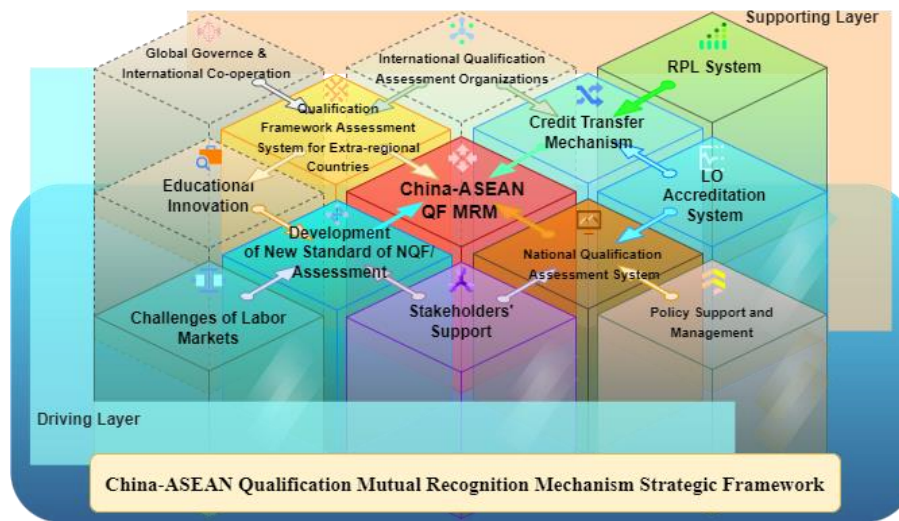


Figure 3. China-ASEAN qualification mutual recognition mechanism strategic framework.

The expression mechanism of learning outcomes is a necessary approach to establish basic rules. The recording, accumulation, and transformation of learning outcomes require connecting various educational entities and integrating education at different levels. Different rules inevitably deviate from the original intent of institutional design. Among different higher vocational colleges, there exist variations in the application standards of learning outcomes. Even for the same course, between junior colleges and universities, vocational education and general education, formal learning and informal learning, mutual recognition of learning outcomes is challenging. Coupled with strict student enrollment management, graduates from Chinese vocational colleges have a limited demand for the recognition of higher academic achievements and the conversion of learning outcomes between different types of education.

The effectiveness, feasibility, and inclusiveness of learning outcome recognition present varying degrees of issues in different countries. Laos and Myanmar’s qualification frameworks only provide descriptions of learning outcomes at various levels, lacking clear certification standards for vocational education. Thailand’s qualification framework initially only covered higher education levels, but it has now established a more comprehensive NQF system. Given the current context of labor supply shortages and educational wastage due to school dropouts among eligible youth, Thailand also needs a feasible vocational skill certification mechanism.

The learning outcomes recording and certification system of China’s vocational education system consists of two aspects: National Education Credit Bank Systems (ECBS), and the “1 + X” certification (XCERT). They provide institutional environment and practical foundation for each other. Currently, the problems of lack of cooperation among organizations, the issue of the lack of effectiveness in recognizing learning outcomes is also quite prominent.

The “National Standards for Undergraduate Teaching Quality of General Higher Education Institutions” formulated by MEPRC mainly calculates credits based on class hours. Class hours refer to the unit of teaching time and are also known as contact hours. Many disciplines specify the conversion relationship between credits and class hours. Typically, for theoretical courses, 16 to 18 class hours are equivalent to 1 credit. The “National Standards for Professional Teaching in Higher Vocational Colleges” also have overall requirements for various disciplines: the total class hours are generally around 2800, with every 16 to 18 class hours equivalent to 1

credit. Higher vocational education places more emphasis on practical components, requiring practical teaching to account for no less than 50% of the total class hours. However, when calculating credits, there is no further distinction between theoretical and practical courses, nor are there regulations specifying in-class and out-of-class study time. Regardless of whether it is the standards for higher vocational education or specialized disciplines, there is no clear definition of the relationship between classroom learning time and after-class study time for various types of courses.

Given the current state where the credit bank system is unable to fulfill its intended role of recording, accumulating, and exchanging learning outcomes, many universities in large Chinese urban clusters are adopting an agreement-based approach^[43]. This involves mutually agreeing upon the rules of recognition between certifying institutions. However, this method is not an effective solution for addressing cooperation issues in other regions. Therefore, establishing a foundational institutional framework guided by the NQFs is essential. This entails constructing a standardized system at the national level. Moreover, when aligning with cooperating countries' NQFs, these standards can effectively express learners' learning outcomes and problem-solving abilities. A verification and supplementation mechanism should also be established to address practical obstacles between the two systems.

Following the previous cooperation models within ASEAN member states, qualification reference expert group will be established to ensure reasonable interfacing. At least one international expert and one observer from other member countries will be in every team that is going to work in this observer's country. This mechanism will ensure effective education or training for learners while recording and conveying sufficient authoritative information, in order to promote trans-regional transfer and recognition through the quality assurance mechanism. The standard of quality assurance mechanism has three dimensions: (1) The quality standard that will be used as the technical specification of quality assurance; (2) the effectiveness standard that covers competency standard, assessment standard, and evidence standard; (3) data standard that defines the principles of data collection^[44,45]. All the items above will form the working standard that will be followed by qualification education and training institutions.

In less developed countries at the vocational education level, there are several real societal issues to address. In Myanmar, approximately 70% of the population resides in rural areas where there is a lack of educational facilities. With over 100 different languages spoken, achieving the goal of Education for All (EFA) is challenging. Moreover, discrimination within the education system limits opportunities for minority groups, contributing to higher dropout rates^[46]. Both Myanmar and the Philippines face challenges in terms of vocational education teachers lacking adequate subject-specific training^[46,47]. Furthermore, due to limited domestic labor market opportunities, learners tend to seek employment abroad. A survey conducted in the Philippines revealed that 76.4% of respondents preferred seeking employment overseas^[47]. Therefore, policymakers in these regions must pay close attention to creating a supportive policy environment to ensure the effective establishment of a national TVET framework. The regulatory authorities need to comprehend the efficacy of the NQF's performance. Relevant departments should provide reasonable policy interpretations regarding the practical implementation of TVET QF and standardize the execution within their respective domains.

4.2. Stage 2 and corresponding strategies

In the second stage, within the qualification certification framework of VE in countries and regions, the transformation design for prior-learning outcomes will be carried out. In the transformation mechanism, the function of absorbing the prior-qualification records and certification outcomes will be focused on. Generally, it means the prior-qualification certification will be incorporated into the unified professional qualification

certification framework. This is not only a solution to the remaining problems within the framework of China's national qualification certification but also a way for China and ASEAN countries to communicate and upgrade their experience. For instance, the establishment of the Brunei Darussalam Qualifications Framework (BDQF) is a critical step towards improving the quality of education and training in Brunei^[48]. The BDQF will be developed based on international best practices and will include a set of defined levels and descriptors that describe the knowledge, skills, and abilities individuals should achieve at each level. It will cover all levels of education and training, as well as all the accumulation of learning outcomes, functioning as a part of Brunei's efforts to enhance the quality of its education and training system and align with international standards. This development process and basic concept are also similar to China's related ideas under the BRI cooperation strategy, which aims to expand and deepen the mutual recognition system of qualifications between China and Southeast Asia. This collaborative effort aims to establish regional standards that align with international standards. At the same time, the effectiveness of this function promotes the related countries to transform and absorb existing qualification certification into a new state that will accord with the mutual recognition standards of the NQF; while the effectiveness of this function promotes the related countries to transform and absorb existing qualification certification into a new state that will accord with the mutual recognition standards of the NQF^[29,49].

Three issues in the construction of the qualification framework always arise, whether in China or ASEAN: (1) The problem of integration and connectivity between various educational learning outcomes at all levels, such as general education, VE, higher education, and continuing education, and certification and transformation of skills training; (2) the teaching management procedures and cooperation among colleges and universities lack standardized procedures. Moreover, schools and enterprises have their own understanding of technology domain priorities in co-sharing information and course content updates, and the infrastructure of the co-sharing mechanism needs urgent strengthening; (3) the "all-round development of people" and lifelong education based on humanism will align with the qualification upgrading path of economic development oriented to the demand for talents.

In order to solve these problems, China has explored various types of transformation paths of learning outcomes from the virtual institutional design of the "credit bank" and regional qualification standards. By contrast, ASEAN has developed a flexible mutual recognition mechanism based on the differentiated economic development of various countries. It is possible for China to establish direct, bilateral, mutual recognition channels for NQFs through cooperation with different countries under the overall qualification framework of ASEAN.

It is also important to note that with the large-scale recognition and recording of prior learning outcomes into the credit management system, considering the disparities in previous VE among countries and the differences in economic development, there may arise a substantial need for learners to supplement their learning achievements and bridge the gap in educational quality. This demand may manifest in learners seeking expedited entry into the labor market through more efficient pathways. The proliferation of lifelong learning could also lead to the emergence of a more diverse "multi-skilled" workforce. This could exert significant pressure on existing education systems in various countries. This necessitates more flexible and precise mechanisms for assessing learning outcomes. Even for informal learning, as long as learners pass the assessment of learning outcomes, recognition can be granted. If unsuccessful, supplementary courses are required to ensure competency standards are met. Encouraging the participation of third-party organizations and employers in VE can offer a broader range of skill micro-certifications, alleviating pressures on the education system. The recognition of learning formats, including micro-certifications, through certification processes not only provides learners with more choices but also helps resolve employment challenges in cases

where skill certification is not achieved. The certification testing and supplementary training of learning outcomes can be seen as internal loops within the single certification process. The statistical form of learning outcome certification currently used is credit-based. Credit management includes recording, accumulation, conversion, and exchange. The standard competencies gained by learners through occupational qualification certification in the lifelong learning process are consistently supervised and audited by both internal and external quality assurance mechanisms. Learning outcome certification, credit system, and quality assurance mechanisms are the core elements showcased in this conceptual process, which also constitutes the fundamental operating conditions for cross-system standard certification (**Figure 4**).

As the European Qualifications Framework (EQF) has been established through the integration of QFs in European countries, the increasing demand for open resources and transnational education cooperation has urged higher education institutions to formulate future policies with greater transparency and democracy, and to place greater emphasis on continuity and social responsibility. The Southeast Asian region also has confidence in the comprehensive policy support and resource allocation required for multilateral cooperation developed by the establishment of the qualifications framework. This will lead to a more diverse and inclusive open framework in Asia that draws on pioneers' experience^[50].

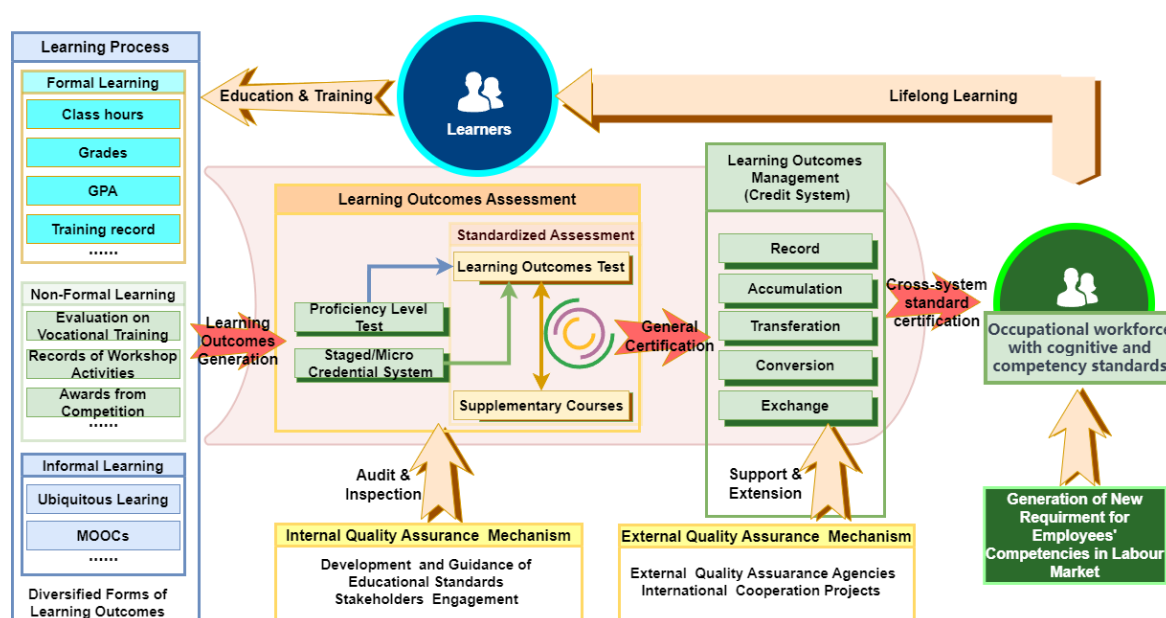


Figure 4. Interconnected elements of standard occupational competence acquisition for TVET learners.

The main goal of this stage is to establish a comprehensive TVET ecosystem that aligns with the unique characteristics of the country, enhancing the quality of education. In Vietnam's TVET system, graduates from vocational schools can enroll in general higher education institutions, whereas vocational students cannot. Furthermore, vocational students lack the option to change their learning paths based on their prior achievements^[51]. Various systems from countries such as Australia, South Korea, the United Kingdom, and Germany are being implemented in Vietnam, necessitating their alignment within the AQRF framework. The assurance of quality and systematic certification of VE systems in these countries needs to be laid as the foundation through internal and external assessments for the next stage. The departments responsible for quality management in various countries should be capable of providing recommendations for improving this system. This includes: (1) The quality review division should place more emphasis on regulatory issues during the operation of the QFs, especially concerning the quality of community training; (2) there should be greater focus on specialized training areas based on enterprise participation; (3) universal learning outcomes standards

should be established through training that is aligned with industry needs and societal development; (4) enhancing financial support and concurrently establishing mechanisms for the introduction of support funds through different channels.

4.3. Stage 3 and corresponding strategies

The third stage involves forming a regional mutual recognition mechanism for the China-ASEAN TVET NQF. This process will be promoted in focused industrial cooperation fields, particularly in areas where a unified mutual recognition mechanism for qualifications has been established and improved, under the industrial planning and the national strategy of the BRI. In the process of interfacing qualifications between different areas, regional differences in humanistic factors will be emphasized, especially maintaining the rights of users who are willing to choose an international working language recognized by the United Nations. The problems exposed in the process of mutual recognition of qualifications will be noticed, and an effective solution mechanism will be established.

To ensure quality in VE and training in East Asia, a transparent framework tailored to the regional context should be developed, covering various aspects such as policies, regulations, institutions, resources, teaching, assessment, quality assurance, and monitoring. This framework should be established and promoted at both national and international levels, with strengthened cooperation among countries to jointly develop and implement quality assurance measures^[52]. In the construction of China's QF, China intends to use the national qualifications framework as a policy tool to promote mutual recognition of individual learning outcomes. However, the current national-level policies have not involved the phased policy objectives, quantitative tasks, completion time, construction plans, supporting measures, etc. As a result, the national-level qualification framework construction mainly outlines the vision in the form of advocacy and calls and seriously lacks policy tools featured as organization establishment, capacity building, and target-driving types. Therefore, in the process of mutual recognition of the qualifications of China-ASEAN VE countries, China will first establish a sector model through regional mutual recognition to drive the substantial promotion of the construction of the NQF. It will simultaneously formulate construction plans in cooperation with ASEAN parties and carry out a phased review and evaluation mechanism to ensure the quality of work in the process of construction objectives. In terms of the "credit bank", China has now developed a ten-level learning achievement framework, setting up more than 670 certification criteria, and created 70 subsidiary centers of learning achievement certification in demonstration districts. Guangdong has developed a seven-level qualification criteria system and released the first set of provincial standards in 2017^[53]. All the above has accumulated important experience for China to formulate the qualification framework.

Using Guangxi, Yunnan, Guizhou, and other border provinces' VE cooperation as a demonstration zone, China has been exploring a new mechanism for mainland vocational colleges to cooperate with ASEAN countries. By strengthening the construction of the China-ASEAN TVET cooperation information platform for the needs of college cooperation, the cooperative information communication path between colleges will be dredged up.

At this stage, ASEAN member countries aim to steadily enhance the quality of vocational education in each country. This involves developing more cross-disciplinary competency training systems and formulating skill training catalogs required by industries. Emphasis is placed on industry-specific soft skills training and the cultivation of knowledge-based employees.

In the context of the profoundly changed global order caused by the epidemic, ASEAN needs to work with China to improve regional governance, jointly promote the optimization and reconstruction of the industrial and value chains and deepen cooperation in training and exchange of vocational and technical

personnel. The responsible authorities for VE and employment in each country need to collaborate with relevant departments to address the following issues: (1) Facilitating reasonable employment mobility within the scope of regional cooperation, (2) Ensuring the sustainable development capabilities of certified workers, (3) Ensuring consistency between certification standards and competencies, and enhancing the motivation of workers to engage in TVET and lifelong learning through the design of a salary grading system.

ASEAN allows diversity under the regional mutual recognition system while also acknowledging the challenges and instability faced under the broad regional framework. It is necessary to formulate a settlement mechanism at an appropriate time to effectively remove obstacles in the work against mutual recognition of the qualifications of both parties. At the same time, on the premise of mutual recognition and cooperation of qualifications, the two parties will formulate corresponding policies and regulations, and organize matched international arbitration institutions. Both parties will also establish and implement punitive clauses bilaterally against organizations or individuals who violate mutual recognition of qualifications.

4.4. Stage 4 and corresponding strategies

The fourth stage is to promote the all-encompassing development of the mutual recognition mechanism of national qualifications between China and ASEAN countries. The regional integration of mutual recognition of qualifications among the countries will be followed by pan-regional cooperation in education. This cooperation will be realized between the regional countries and the EU VE qualification framework, and even the Australian VE qualification framework. Under the framework of the work of the United Nations Educational, Scientific and Cultural Organization (UNESCO), the related work will be performed with non-governmental organizations in global VE. This mainly refers to coordinating the evaluation of global VE qualification recognition standards, levels, stages, and achievement levels so as to achieve mutual recognition of global VE qualifications.

In terms of promoting the construction of the education community, China signed the “Tokyo Convention” in 2011 and the “Global Convention” in 2019. ASEAN also officially released the “ASEAN Qualification Reference Framework Consultation Report” in May 2013 to achieve a NQF covering VE and technical training^[54]. Cooperation in VE and industry integration has been carried out among ASEAN countries. For example, Malaysia and Singapore collaborated to establish an International Vocational Training Institute that provides training closely related to the industry, offering practical education and experience to students^[55]. Additionally, the Chinese government’s Vocational Education Law emphasizes the deep integration of VE and industrial demand, promoting the integration of production and education, school-enterprise cooperation, and the improvement of teaching quality and talent cultivation in VE. Building upon this foundation, the Chinese government and ASEAN countries have strengthened talent exchange and cooperation in the fields of VE and skills training, promoting talent flow and interconnectivity. The Ministry of Education of China and the education departments of ASEAN countries have signed the “China-ASEAN Vocational Education and Human Resources Development Cooperation Plan”, which aims to promote cooperation between China and ASEAN countries in the field of VE and human resource development. In this step, the two sides need to complete the following work: (1) Clearing the policy bottleneck of education cooperation and communication at this stage; (2) Actively developing multilateral and sub-regional education cooperation on the basis of mutual recognition of credits; (3) Perfecting technical support and certification networks. (4) Improving relevant data generation and dissemination; (5) Improving the monitoring and evaluation timeliness and accuracy.

4.5. Stage 5 and corresponding strategies

The fifth stage is to promote harmony and sustainable development between people and society. Education brings the potential for learners to acquire creative value-adding abilities. The infusion of education and training, as well as the growth of learners' value, are interconnected. All of this can be documented, tracked, and transformed through data and online tools. Every value transfer activity in which a person engages, along with the resulting emotions, such as a sense of efficacy and happiness in their real-life interactions, can be quantified and recorded through technological means. The research team of the People's Bank of China has found a pathway in theoretical construction to link individual value information and labor value and financialize them. The acquisition of individual skills and career development can be expressed through digital currency^[56,57]. Promoting economic development and social progress of countries in the region through educational cooperation is the direction and objective result of mutual recognition and cooperation of NQFs of China and ASEAN member countries. In "the Vision 2030 for China-ASEAN Strategic Partnership," it is proposed to strengthen education innovation and academic communication through platforms such as China-ASEAN Education Exchange week. Both sides propose to connect the common focus areas initiated by the "Master Plan on ASEAN Connectivity 2025" and China's BRI, so as to promote the docking of regional connectivity strategies in a mutually beneficial and win-win pattern^[58].

The mutual recognition of the China-ASEAN countries' NQFs is more conducive to the continuous skill and qualification upgrading of talents in transnational and transregional mobility, and further reflects the "practicality of qualifications" in their continuous career. This allows talents to obtain various resources corresponding to jobs, including remuneration, social prestige, social relations, development prospects, and other aspects, thus constantly realizing the need for all-round personal development^[59]. In the process of China-ASEAN's promoting mutual recognition of global VE qualifications, although all the stakeholders confront the insufficiency of political support and cultural communication, the consistency between personal development and social development will be emphasized. Through promoting green skills education, the all-round development of human knowledge and skills based on their certified qualifications will be realized. Finally, the harmonious development between humans and nature will be achieved. This is the work that should be undertaken currently and consistently promoted, as well as a means to achieve the long-term objectives through the implementation of the QFs.

5. Conclusion

At present, ASEAN and China have made a lot of preparations for mutual recognition of NQFs among countries. The mutual recognition of China-ASEAN countries' qualifications framework is not only the result of social needs and personal development but also a requirement for economic integration and industrial development of China and ASEAN, under the strategic framework of BRI. It is necessary to not only bridge the gap between concept and systematic design but also overcome technological barriers and resource gaps^[60].

The mutual recognition of qualifications frameworks between China and ASEAN countries will be carried out in five stages:

- 1) Enhance the core mechanisms and establish a foundational qualification framework.
- 2) Through NQFs (National Qualifications Frameworks), achieve comprehensive management of learning outcomes, thereby promoting the enhancement of the comprehensive capabilities of workers and the management of occupational skills.
- 3) Encourage the participation of stakeholders such as enterprises, and under the premise of ensuring educational quality, establish mutual recognition and cooperation among countries.
- 4) Elevate regional education standards, align with recognition systems in other regions.

- 5) Enhance the content of qualification framework recognition, return to the management of individual labor value, and achieve the personal growth of vocational practitioners and harmonious socio-economic development.

This requires all parties to recognize the importance of forging the NQF and to combine their efforts to promote mutual recognition of the NQF. Simultaneously, the convenience, unity, and scientific validity of the mutual recognition mechanism will be ensured in the practical operation. Every participant of this cooperation will create a favorable atmosphere during the implementation of the phase, contribute in the construction of international standards, and establish leading norms for global education cooperation together.

At present, the system construction of the qualification framework within ASEAN is developing rapidly, and the educational cooperation between China and ASEAN is also increasingly strengthened. Further research will focus on the following aspects:

- (1) Role of stakeholders

The current design and implementation of the qualification framework is spearheaded by government regulatory bodies. Primarily, it's based on feedback from educational institutions' teaching scenarios. However, the absence of relevant research and policies has reduced the motivation of stakeholders to participate in the development of the qualification framework. Yet, the role of stakeholders, such as industries guiding curriculum practices, course practices, and interdisciplinary planning, is significant. Hence, there's a need to further study the stakeholders of the mutual recognition of qualification frameworks—particularly, the participation methods, extent of involvement of industry organizations and enterprises, and their expectations and needs from mutual recognition policies.

- (2) Diverse collaboration models

Variations in industry growth and the associated labor demands among countries are natural and persisting phenomena. Earlier qualification frameworks and certification systems were largely focused on consistent standards and operational rules. However, in international cooperation, the perfection and extension of vocational education systems should consider the local industrial development status and economic levels. We ought to embrace and respect regions lagging in economic growth, promoting technical assistance and educational exchanges. Therefore, it's essential to observe the collaborative models of different ASEAN countries regarding the mutual recognition of qualification frameworks and discuss the impact and challenges of multilateral, bilateral, and regional cooperation methods.

- (3) Grasping future development trends

The current trend of deglobalization emerging from disruptions in international political and economic orders has profound implications for international economic development and industrial upgrades. The East and the West are increasingly forming two distinct yet intersecting systems, encompassing educational cooperation. The significance, diversity, and challenges of regional cooperation are also notable. Thus, a deeper examination of the future developmental trends of mutual recognition of qualification frameworks in the ASEAN region is necessary.

In the process of this research, I have received guidance and participation from some experts from the International Baccalaureate Association, University of Technology Malaya, the Ministry of Education of China and other government agencies or international agencies. I would like to thank you here! The limitations of this study lie in the significant policy differences between China and ASEAN, preventing a comprehensive comparative analysis. The establishment and mutual recognition of qualification frameworks also involve areas beyond educational policies, requiring comprehensive consideration in future research.

Author contributions

Conceptualization, BL and MA; methodology, BL and WL; validation, AAL and NFMA; formal analysis, BL and LW; investigation, YM and CZ; resources, NFMA and DHED; data curation, AAL; writing—original draft preparation, BL; writing—review and editing, BL and YM; visualization, WL; supervision, MA; project administration, YM. All authors have read and agreed to the published version of the manuscript.

Conflicts of interest

The authors declare no conflict of interest.

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Appendix A

Table A1. The policy documents related to China-ASEAN mutual recognition cooperation on qualifications frameworks.

Current policies		Directional document for initiatives and cooperation	
	China (Code: C)	ASEAN (Code: A)	(Code: D)
Guiding policies (Code: GP)	(File Code: GP-C1~C7) 1. National Medium- and Long-Term Education Reform and Development Plan Outline 2010–2020 ^[61] 2. Educational Action Plan for the Belt and Road Initiative ^[62] 3. China’s Education Modernization 2035 ^[63] 4. National Implementation Plan for Vocational Education Reform ^[64] 5. The 14th Five-Year Plan for National Economic and Social Development of the People’s Republic of China and the Long-Range Objectives to 2035 ^[65] 6. Action Plan for Enhancing the Quality and Excellence of Vocational Education ^[66] 7. Opinions on Promoting High-Quality Development of Modern Vocational Education ^[67]	(File Code: GP-A1~A5) 1. Myanmar National Education Strategic Plan 2016–2021 ^[72] 2. TVET 4.0 Framework 2018–2025 ^[73] 3. Malaysia Education Blueprint 2013–2025 ^[74] (Including 3 supporting policy documents more: (1) Executive Summary—Malaysia Education Blueprint 2013–2025; (2) Preliminary Report Malaysia Education Blueprint 2013–2025; (3) Preliminary Report—Executive Summary Malaysia Education Blueprint 2013–2025) 4. Malaysia Education Development Plan 2015–2025 ^[75] 5. Department of Higher Education Strategic Plan 2018–2022 ^[76]	(File Code: GP-D1~D6) 1. The ASEAN Declaration on Human Resources Development for the Changing World of Work and Its Roadmap ^[92] 2. The Second Joint Statement The 12th ASEAN Education Ministers Meeting ^[93] 3. Plan of Action to Implement the ASEAN-China Strategic Partnership for Peace and Prosperity (2021–2025) ^[94] 4. Roadmap on the ASEAN Higher Education Space 2025 and Its Implementation Plan ^[95]
NQFs (Code: NQ)		(File Code: NQ-A1~A9) 1. ASEAN Qualifications Reference Framework ^[77] 2. Malaysia Qualifications Framework ^[78] 3. Indonesia Qualification Framework ^[79] 4. Philippine National Qualifications Framework ^[80] 5. Brunei Darussalam Qualifications Framework, (2013) ^[81] 6. Vietnamese Qualifications Framework ^[82] 7. Cambodia Qualification Framework ^[83] 8. National Qualifications Framework for Higher Education in Thailand ^[84] 9. National Qualification Framework of Myanmar ^[85]	Assessment and Reports of International Organizations (File Code: AR-1~3) 1. Vietnam Technical and Vocational Education and Training Sector Assessment ^[96] 2. ASEAN Cooperation on Education and the SDG 4 ^[97] 3. Enhancing the Competitiveness of Human Resources through Responsive TVET Curriculum Supported by Involvement of Industries and Labour Market Information ^[98]
Teaching quality standards (Code: QS)	(File Code: QS-C1~C2) *1. National Standards for the Teaching Quality of Undergraduate Programs in General Higher Education Institutions ^[68] *2. Teaching Standards for Higher Vocational Colleges ^[69]	(File Code: QS-A1~A5) *1. National Occupational Skills Standards (NOSS) ^[86] (Including 7 documents: (1) NOSS Proposal Filing Guide Form;	

		(2) National Occupational Skills Standards (NOSS) Brochure; (3) Occupational Framework (OF 2020); (4) Guide for the development of Written Instructional Material Edition (2020); (5) Guidelines for the Development of Framework for Work (of 2020 Ed.); (6) 2020 Edition of the NOSS Development Guide; (7) Standard Employment Application Flowchart, (2021) 2. Singapore Workforce Skills Qualification ^[87] *3. Malaysia Skills Certificate ^[88] 4. Malaysia Education Blueprint 2013–2025 ^[89] 5. The Development of Educational Quality Assurance Framework in Lao PD ^[90]
Credit management (Code: CM)	(File Code: CM-C1) 1. Implementation Opinions (Trial) on Credit Recognition and Conversion in Higher Education by the Department of Education of Guangdong Province ^[70] 2. Opinions of the Education Department of Guangdong Province on the Implementation of Credit Management in General Higher Education Institutions ^[71]	(File Code: CM-A1(1-8)) Source: Policies and Guidelines on University Mobility in Asia and the Pacific (UMAP) Credit Transfer Scheme (UCTS) ^[91] (Including 8 policy documents: (1) CMO 1 series of 2000—Policies and Guidelines in the Implementation of International Linkages and Twinning Programs; (2) CMO 55 series of 2016—Policy Framework and Strategies on the Internationalization of Philippine Higher Education; (3) Republic Act No. 11448—The Transnational Higher Education Law; (4) Implementing Rules and Regulations of the Transnational Higher Education Law; (5) CMO 62 series of 2016 Policies, Standards, and Guidelines (PSGs) for Transnational Education Program; (6) CMO 11 series of 2014—Guidelines for the Participation of Selected Higher Education Institutions (HEIs) in Asian International Mobility for Students Program; (7) CMO 19 series of 2015—Operational Guidelines for the Implementation of Asian International Mobility for Students (AIMS) Program (8) CMO 11 series of 2019—Procedure for the Issuance of Non-Immigrant Visa under Section 47 (A)(2) for Exchange Students under the Asian International Mobility for Students (AIMS) Program)

Note: * means starting from a certain year, the implication is that the document has been undergoing repeated revisions since its publication.

Appendix B

Table B1. Background of the interviewed experts.

	Gender	Age	Highest level of education	Research experience (years)	Title	Research area	Position type	Country/Territory of origin
1.	Male	57	Doctorate	30	Professor	Education Policy	Government	China
2.	Male	50	Doctorate	25	Professor	TVET, Humanities	University	China
3.	Male	48	Doctorate	18	Senior researcher	Educational Economics	Official Think Tank	China
4.	Male	52	Doctorate	22	Professor	Educational Management	NGO	China
5.	Male	39	Doctorate	10	Associate professor	Educational Governance	Official Think Tank	China
6.	Female	38	Doctorate	12	Professor	TVET, Organizational Behavior	Official Think Tank	China
7.	Male	42	Doctorate	13	Professor	TVET, Sustainability	Government	Malaysia
8.	Male	47	Doctorate	17	Senior researcher	Educational Management	Official Think Tank	Malaysia
9.	Male	45	Doctorate	17	Professor	Political Science	University	Hong Kong
10.	Male	37	Doctorate	10	Professor	Educational Economics	University	Thailand
11.	Male	44	Doctorate	10	Professor	Educational Management, Pedagogy	University	Philippines
12.	Female	60	Doctorate	23	Professor	Educational Management, Public Administration	University	Singapore

Appendix C

Table C1. Theme analysis of policy texts.

Theme	Function	Responding to change	Encouraging behavior	Providing guidance and support	Normative development	Problem-solving	Safeguarding rights	Promoting coordination and cooperation
Learning outcomes management		○●	○●	○●	○●	●	●	○●
Transformative educational policies		○●	○●	○●	○●	○●	●	○●
Employment improvement		○		○●	●	●	○	○●
Alignment with industries upgrading		○●	○			○●	●	○
System innovation		●	○	○●		●	●	○
TVET quality & certification			○	●	○●	○●	○	●
International cooperation		○●		○●		●		○●
Supportive complementary policies		●	○	○●	○●		○●	●

[○ China ● ASEAN].

Note: The frequency analysis presented in this table focuses on themes that appeared with a certain minimum frequency in the policies of both parties. Only themes meeting this criterion are considered for statistical comparison, aimed at highlighting significant disparities between the two countries' policies.