DOI: 10.53469/jrve.2025.7(09).06

Global Competence Development in Dual Vocational Education and Training: A Comparative Analysis of Spain and China's Implementation Strategies

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Abstract: ***This study examines the development of global competence within Dual Vocational Education and Training (Dual VET) systems through a comparative analysis of Spain and China's implementation strategies. As globalization intensifies demand for internationally competent technical professionals, vocational education systems must adapt to cultivate students' intercultural communicative competency, technical proficiency, collaborative ability, and global awareness. Spain's Dual VET system, integrated within European Union frameworks since 2012, demonstrates systematic approaches to global competence development through competency-based curricula, multilevel progression structures, multi-stakeholder governance models, and extensive international workplace training opportunities. In contrast, China's Dual VET implementation, despite over forty years of German model adaptation, remains primarily project-based with limited systematic coverage and government-dominated governance structures. Through comparative analysis across legal frameworks, social partner involvement, curriculum design, and international mobility mechanisms, this research identifies key success factors from Spain's experience and examines their transferability to China's context. The findings reveal that effective global competence development requires systematic integration rather than isolated interventions. Strategic recommendations for China include developing competency-based standards, establishing balanced industry-education collaboration councils, and implementing comprehensive international mobility frameworks through regional pilots. This study contributes to international discourse on Dual VET globalization by demonstrating adaptation strategies that preserve institutional integrity while leveraging proven international practices for enhanced global competence development.***

Keywords: Global competence, Dual VET, Comparative education, International cooperation.

1. Introduction

With the ongoing process of globalization, vocational education worldwide faces increasing challenges and opportunities. Globalization has not only blurred the boundaries between businesses and markets but also led to a growing demand for skilled talents who possess international competitiveness and intercultural communication abilities. Meanwhile, due to the global economic and financial crises in 2008-2009 and 2020, and the increased global need for qualified workers, many countries would like to implement variations on such a vocational education and training system [1]. In this context, vocational education must adapt to the changes brought about by globalization, aiming not only to train local talents but also to provide students with global competence, preparing them for working in multinational companies and global work environments.

From the early 1980s, China has been introducing the German Dual Vocational Education and Training (hereinafter Dual VET) model, and it has been more than forty years since then [2]. During this period, the government has issued a series of policy documents to accelerate the development of vocational education, and in 2022, revised the Vocational Education Law to further promote vocational education reform and high-quality development. In 2023, the Action Plan for Empowering and Enhancing Industry-Education Integration in Vocational Education further clarified the goals and key tasks of industry-education integration, striving to elevate educational institution-enterprise collaboration to a higher level [3]. In the context of Dual VET, China has developed a relatively complete system of policies and regulations, and industry-education integration platforms have also been steadily improving. However, the depth and breadth of educational institution-enterprise collaboration remain insufficient, with short-term, superficial internships and employment still in the majority, and the establishment of long-term, stable cooperation mechanisms is still limited [4]. Although the *Double High-levels Plan* (a Chinese national program for the construction of high-level vocational colleges and programs), which China has implemented since 2019, clearly proposes the goal of improving the level of internationalization and encourages vocational colleges to cooperate with multinational enterprises to cultivate technical and skilled talents with an international vision, the Belt and Road initiative has further promoted the cooperation in running schools between vocational colleges and countries along the route, cultivating local talents with both professional and international qualities. However, the training of students' global competence is still in the stage of exploration and partial practice, and a systematic framework has not yet been formed [5].

As one of the Member States of the European Union, Spain incorporated Dual VET in 2012, which has been in place in all autonomous communities by 2014 [6]. In addition to the initial legislative support provided by *BOE Real Decreto 1529/2012*, Spain has subsequently issued 3 other legal documents to regulate and specify the implementation of its Dual VET system [7]. Since then, this educational scheme has become a fundamental pillar to train the working population, as well as a political priority of both national and regional

governments [8,9]. According to the European Commission, by 2018, after 6 years of implementation, preliminary data and reports show that Dual VET is a powerful education mechanism that enables young people to enter into the labour market swiftly and sustainably [10]. Admittedly, the model has demonstrated remarkable short-term socioeconomic impacts. Its rapid growth not only improved youth employment rates (exceeding 80% in sectors like healthcare and administration) but also aligned training programs with Industry 4.0 demands, driving regional economic modernization [11]. Moreover, Spain's Dual VET system fosters students' global competence through a multidimensional strategy that integrates European education policies, along with the EU initiatives providing critical funding, intercultural skill development, internationalized school-company collaboration, and curriculum reforms. It is true that the EU's support has been pivotal, apart from funding mechanisms and policy alignment, the institutional collaboration led by it having played a more important role in the advancement of the education system's internationalization, such as the benchmarking and best practices offered by European Centre for the Development of Vocational Training (CEDEFOP) and the European Alliance for Apprenticeships (EAA).

From a historical perspective, VET systems are the results of adaptive processes with different underlying features within their respective national setting [12]. Although a model which suits all settings is unlikely to occur, there still could be plausible transfer in terms of success factors from Spain to China. Building upon the substantial body of existing empirical research, this study aims to characterize the implementation of Spain's Dual VET scheme, specifically in relation to how it contributes to the development of students' global competence. The study will identify the key success factors that have supported the effectiveness of this model in promoting internationalization within vocational education, while also exploring its inherent limitations and areas for improvement. Through this examination, the research intends to offer valuable insights for the adaptation and application of similar strategies in China's context. By drawing lessons from Spain's experience, this study seeks to inform the ongoing discourse on global competence development in the Dual VET, contributing to the refinement of Dual VET models and policy reforms in China.

2. Literature Review

2.1 Definition of Global Competence in the Dual VET Context

Global competence, referring to "国际化素养" or "全球胜任力" in Chinese, has been nurtured by myriad educational stakeholders, policymakers, and organizations, such as *Project Zero* at Harvard University (2009), the *Global Citizenship Education* initiative from the United Nations Educational, Scientific, and Cultural Organization (2015), a global competence assessment in the *Program for International Student Assessment* (PISA) 2018 by the Organization for Economic Cooperation and Development (OECD) [13], while PISA is the first study which has assessed the global competence of students around the world from an international comparative perspective [14].

Table 1: Literature review of global competence definition and dimension

Citation	*Definition*	*Dimension*
Hunter's global competence checklist [15]	Having an open mind while actively seeking to understand cultural norms and expectations of others, leveraging this knowledge to interact, communicate and work effectively outside one's environment.	(1)**Knowledge** of world events and foreign cultures. (2)**Skills** to cooperate cross-culturally and adaptability in a cross-cultural environment. (3)**Attitudes** toward cultural diversity and preparedness to involve in the diversity.
Global Competence Model [16]	Having flexible, respectful attitudes, including self-perspective, and applying knowledge of the historical, geographic, and societal factors that influence cultures in order to effectively interact and build relationships with people around the world.	(1)**Internal Readiness** (self-perspective and attitudinal drivers): self-awareness, open-mindedness, attentiveness to diversity, risk taking. (2)**External Readiness** (acquired knowledge through education or life experience): global awareness, historical perspective, intercultural capability, collaboration across cultures.
Global competence assessment in PISA 2018 [17]	The capacity to examine local, global and intercultural issues, to engage in open, appropriate and effective interactions with people from different cultures, and to act for collective well-being and sustainable development.	(1)**Knowledge**: Understanding local, global, and intercultural issues. (2)**Skills**: Engaging in open, appropriate, and effective interactions across cultures. (3)**Attitudes**: Understanding and appreciating the perspectives and worldviews of others. (4)**Values**: Taking action for collective well-being and sustainable development.

On the other hand, the Chinese government also prioritizes vocational education internationalization as a national strategy, explicitly stating: "It is imperative to refine the international cooperation mechanisms for industry-education integration and institution-enterprise collaboration in vocational education, while consolidating and expanding offshore educational institutions*", from the *Master Plan for Building a Strong Education Nation* (2024–2035) [18].

(**The term "offshore educational institutions" refers to China's state-backed vocational education projects abroad in the context of the Belt and Road Initiative, such as the Luban Workshops and the Zhenghe Colleges.*)

As outlined by the aforementioned literature, in the context of Dual VET, the definition of global competence is structured around 4 key dimensions:

- **Intercultural communicative competency:** cultural sensitivity and foreign language skills.
- **Technical proficiency:** to adapt to and navigate the operational dynamics of international workplaces.
- **Collaborative ability:** to manage cross-cultural teams in global work settings.
- **Global awareness and responsibility:** to act for

collective well-being and sustainable development.

2.2 Influencing Factors

The influencing factors of global competence have emerged as a key research focus in academia [19]. Although disagreement exists on the exact definitions, scholars do in fact agree on many of the components that contribute to global competence. Based on their comprehensive and in-depth exploration, and for the purpose of this study, factors influencing global competence in the context of Dual VET include the following aspects:

- **Individual agency:** level of foreign language proficiency and second language learning motivation. As Meng *et al*. examined from a web-based survey responded by 206 Chinese students in Belgium, both English and local language proficiency were significant predictors of global competence [20]. While Semaan & Yamazaki also stated that there was a positive relationship between global competence and second language motivation, as well as between global competence and the components that are seen as constituting second language learning motivation, based upon a 30-item Likert scale survey with data collected from 137 participants who were studying critical languages at two universities in the United States. Within this population of language learners, the greater a student's motivation was to learn the second language, the greater the likelihood that the student viewed him- or herself as being globally competent, and vice versa [21].

- **Learning environments:** intercultural exposure, curriculum and pedagogy, and learning approaches. Mintzberg & Gosling claimed that to broaden people beyond geographic boarders, a truly balanced international experience should be provided, and they need to live cross-cultural experiences as authentically as possible [22]. Similarly, Vance pointed out that work experience abroad can be valuable for developing global competencies that promote organizational effectiveness and individual career success. Moreover, he suggested additional appropriate curricular emphases should include foreign language study and international internship opportunities [23]. Through the teaching practice with Collaborative Online International Learning (COIL), Naicker *et al*. found that post-COIL, students were more open to learning about other cultures, different religions and traditions, after such accessibility to communicating and collaborating with peers internationally through online [24]. According to the study of Peifer *et al*., diverse peer relationships among students contribute to their increased intercultural competence [25]. In the same vein, Meng *et al*. noted that interactions and friendships with multi-national students played a very important role in the process of global competence development [26]. In the context of learning approaches and strategies, situated learning and ethnography of communication are especially useful for recovering the emic knowledge still under-exploited in cross-cultural management (CCM) learning [27]. Additionally, experiential approaches for cultural intelligence (CQ) development have been proposed as highly effective, as CQ represents a promising advancement in the area of cross-cultural training and management [28]. For example, to cultivate students' global competence, educators could integrate intercultural simulations into curricular activities.

- **Societal ecosystems:** Contemporary Information and Communication Technologies (ICTs), particularly social media platforms and portable smart devices (e.g., smartphones and tablets), have revolutionized intercultural engagement by creating dynamic digital spaces that significantly contribute to the cultivation of students' global competence. The study of Cao & Meng indicated that at low, rather than at high levels of direct contact, mediated contact (through foreign TV series and movies) had indirect relationships with all three dimensions of global competence via the mediator of intergroup anxiety [29]. Furthermore, Fox's paper proposed that, while mobile devices may have contributed to a growing need for globally competent individuals, they can also be used to expand these capacities within university students [30].

Overall, the prior studies above have examined and clarified the significant contributions to the development of global competence at individual, environmental, and societal levels. Recognizing and leveraging these multifaceted factors can lead to more effective strategies in preparing students for active participation in an interconnected global community.

2.3 Cultivation Pathways

Global competence is a teachable attribute that can be effectively cultivated by providing students with well-integrated learning opportunities [31]. The following sections detail three key pathways identified through empirical research, which reflect diverse pedagogical strategies, from virtual interactions to community-based projects, and are evaluated for their effectiveness in fostering global competence.

- **Cross-cultural collaboration:** both direct and indirect contact have proven effective. Traditionally, direct cross-cultural experiences and global perspectives could be acquired via study abroad programs, as documented by studies [32]. Nevertheless, apparent constraints do exist in these programs, such as considerable costs and time commitment, thus making study abroad an option for a relatively small number of students. As Mintzberg & Gosling proposed, developing classes that are truly balanced across borders could be an alternative. For example, intercultural interaction and cultural intelligence acquisition may occur where domestic students and international students are well organized through appropriate course design. On the other hand, virtual collaboration involving students from different countries working together on assignments via digital platforms, also fosters global competence, confirmed by experiments and practices. This approach is notable for its scalability and accessibility, offering a practical solution particularly for resource-limited educational environments.

- **Curriculum creation:** extracurricular projects

integration and academic offerings enhancement. An innovative global competence certificate program, consisting of specific courses and international experiences, has been introduced at Sweden's largest technical university, KTH Royal Institute of Technology by Kjellgren & Keller [33]. Their study, representing Swedish engineering education, was presented at the 2018 *IEEE Integrated STEM Education Conference*, highlighting the enhancement of students' global competence and the quality of international mobility. This pathway is especially effective for students seeking a systematic approach, emphasizing the role of structured interventions without disrupting existing programs. While the study of Crawford *et al*. demonstrates embedding the development of preservice teachers' global competence in the course design through a multifaceted approach [34]. With the content anchored in globally recognized frameworks such as the United Nations Sustainable Development Goals (SDGs), this course employs authentic, experiential learning strategies to cultivate empathy, perspective-taking, and critical reflection, and ultimately, to enable them to translate global awareness into actionable teaching practices. It creates a developmental pathway that equips future educators with the competencies required to address and navigate the challenges of a multicultural and interconnected world.

- **Blended strategies:** fusion of local actions with global perspectives. According to a study by Yu & Duchin, piloted at Howard Community College, they developed an innovative curriculum that integrates local community engagement with global competence by merging top-down pedagogical approaches with bottom-up, student-initiated projects [35]. At its core, the curriculum encourages students to identify, analyze, and address local challenges through hands-on projects, and situates these issues within the broader framework of global challenges and the SDGs. Moreover, the curriculum emphasizes the development of digital skills essential for modern problem solving. This dual focus—on enhancing sustainable development awareness and fostering technical proficiency—prepares students to act as proactive agents of change in both local and global contexts. Notably, the projects' scalability—adaptable to other Maryland communities and beyond—underscores their potential to contribute to both local well-being and global sustainability goals.

Collectively, these varied yet complementary pathways highlight the transformative promise of well-integrated learning experiences, offering valuable insights and a robust foundation for future research and practical applications in global competence education.

3. Comparative Analysis

There are notable discrepancies at the practical levels of implementation between the Dual VET systems of Spain and China. Below is a comprehensive comparative framework analyzing the differences between them, with a focus on their approaches to cultivating students' global competence. The analysis is structured across several dimensions grounded in empirical research and case studies.

3.1 Legal and Policy Frameworks

Spain's Dual VET system, unified under *Organic Law 3/2022*, ensures national consistency, with modular and flexible structures that integrate academic education with workplace training [36]. China's Dual VET policies, while nationally set, vary by province, with reforms like new apprenticeships still maturing since 2022. According to Chinese scholar Zhuang Xizhen, in a geographically vast country like China with significant regional disparities in economic and social development, it is impractical to implement a single, unified vocational education development model. Instead, Zhuang proposes that vocational education innovation should be conducted on a regional basis, tailoring approaches to address the specific needs and characteristics of different areas [37].

Furthermore, Spain's Dual VET system is deeply integrated with EU policies, such as the *Copenhagen Declaration (2002) and the Bruges Communiqué* (2010), which prioritize work-based learning (WBL) and international competitiveness. *Royal Decree 1529/2012* formalized Dual VET in Spain, mandating WBL at a minimum of 25% of program time during the first year, which can increase up to 75% in subsequent years, and encouraging international mobility, which reflects the EU's broader apprenticeship model, fostering collaboration with countries like Germany, whose Dual VET system is an international benchmark, with its elements being adapted to the Spanish context [38]. Such alignment positions Spain within a cohesive European vocational education landscape.

In comparison, at the national level in China, from 2016 to 2022, six legal and policy documents explicitly addressed and placed significant emphasis on the internationalization of VET, demonstrating China's strategic commitment to enhancing its VET system through international engagement and collaboration. However, as suggested by the proportion of evaluation indicators concerning cross-border educational initiatives in the *Annual Quality Report of Higher VET* and the percentage of knowledge transfer focused award-winnings in China's National Vocational Education Teaching Achievement Awards, Chinese government departments have disproportionately incentivized and guided VET internationalization toward the dissemination of expertise [39]. Insufficient attention has been given to strengthening the building of internal capacity, such as internationalizing domestic curricula and teaching methodologies, cultivating global competence among local students, and developing internationally competent faculty [40].

Table 2: Legal and Policy Frameworks Comparison

Aspect	*Spain*	*China*
Governance and Consistency	Unified under *Organic Law 3/2022*, ensuring national consistency.	Nationally set policies with provincial variations due to regional disparities.
Flexibility and Structure	Modular and flexible structure integrating academic education with workplace training.	Emphasis on regional innovation to address specific local needs.
Workplace Training	*Royal Decree 1529/2012* mandates a minimum of 25% WBL in the first	Reforms like new apprenticeships are still maturing.

Integration	year, increasing up to 75% in subsequent years.	
International Alignment	Deeply integrated with EU policies such as the *Copenhagen Declaration* (2002) and *Bruges Communiqué* (2010), influenced by Germany's Dual VET system.	Six legal and policy documents from 2016 to 2022 focused on internationalization.
Focus of Internationalization	Encourages international mobility, work-based learning, and competitiveness, aligned with the EU's VET framework.	Greater focus on disseminating expertise, less on internal capacity building (e.g., internationalizing curriculum and fostering global competence).

Table 3: Social Partner Involvement Comparison

Aspect	***Spain***	***China***
Governance Structure	Tripartite collaboration among educational authorities, industry, and trade unions with shared decision-making responsibilities.	Government-led system with hierarchical coordination. Industry and social partners participate within state-defined parameters.
Policy Formulation	Educational authorities set frameworks; industry identifies skill needs; trade unions provide consultation.	Centralized government policy-making with industry association input. Government retains final authority.
Curriculum Design	Joint development between educational institutions and industry partners aligned with market demands.	Government-prescribed core curriculum with limited, project-based enterprise involvement.
Program Delivery	Dual model: institutions handle theory, enterprises provide practical training and mentorship.	Institution-centered delivery under government supervision. Enterprise participation remains fragmented.
Quality Assurance	Multi-stakeholder framework using EQAVET standards. Industry contributes resources; trade unions ensure transparency.	State-controlled assessment system. Industry input operates within government-set boundaries.
Monitoring & Evaluation	Educational authority evaluations with industry feedback channels and trade union oversight of agreements.	Government-conducted assessments with limited industry feedback integration.
Primary Challenges	Multi-stakeholder coordination complexity and quality standardization across programs.	Limited stakeholder autonomy, insufficient enterprise engagement, institutional rigidity.

3.2 Social Partner Involvement

Spain's VET system involves deep engagement from social partners, with industry enterprises, trade unions, and educational departments, where significant effort has been invested to this end, which can also be seen as a multi-stakeholder synergy. According to the study of Zaunstöck *et al*., in the first place, vocational committees were established where union and employer representatives, together with VET teachers, and education and employment administrators, collaborated to build both the framework and detailed specifications for vocational qualifications, including profiles, learning outcomes, competency-based curriculum, subject definitions, practical knowledge components, and institutional requirements [41].

From a historical and cultural perspective, in the 1980s, the need for skilled workers and middle-level technicians has prompted companies, via their associations, to communicate VET qualification needs to the Basque regional authority. This private-public dialogue, supported by resource allocation and system enhancement from the Basque Government and provincial councils, strengthened the Dual VET framework, which exemplifies how gradual, flexible policy implementation—underpinned by consensus-building among key social actors—can transform regional VET systems into engines of economic and social development [42].

China's vocational education governance system demonstrates a distinctive multi-level, collaborative framework that integrates government leadership with broad social participation. *Vocational Education Law of the People's Republic of China* (2022 Revision) establishes fundamental principles in Article 2, emphasizing "hierarchical management, local leadership, industry guidance, educational institution-enterprise collaboration, and social participation" [43]. This comprehensive legal structure creates a system wherein the state ensures vocational education alignment with national development priorities, while simultaneously delegating substantial responsibilities to local governments and fostering collaboration with industry partners and social entities. Research indicates that provincial-level coordination has emerged as a crucial mechanism for regional integration of industry and education, addressing the heterogeneous needs across China's diverse regions [44].

Non-governmental organizations, particularly industry associations and enterprises, fulfill increasingly critical functions within China's VET system. The *Vocational Education Law* explicitly mandates enterprise participation in VET, requiring businesses to "formulate plans for employee training and provide vocational education to prospective employees" and to contribute essential resources and expertise to ensure training programs align with industry requirements. Sun Jian acknowledges the significant role of industry associations in developing standards and regulations based on industry demands, but points out challenges' persistence, such as insufficient motivation and weak participation [45].

The VET governance systems in China and Spain both involve multiple stakeholders, yet we can see that their structures and operational dynamics differ significantly. China's system is characterized by strong governmental control, with policies and implementation heavily directed by the state, often at the expense of broader stakeholder influence. In contrast, Spain adopts a more collaborative approach, where educational administrative bodies, industry enterprises, and trade unions share responsibilities, ensuring alignment with labor market demands and equitable training conditions. Both systems face challenges in stakeholder coordination and quality assurance, whereas China additionally contends with limited participation from non-governmental actors due to its centralized framework.

3.3 Curriculum Design and Implementation

While Spain's VET system has historically prioritized employability through a competency-based framework,

notably *Organic Law 3/2022* has strategically integrated global competence as a core dimension of its curriculum design and implementation. This integration extends beyond mere language acquisition, aiming to cultivate professionals equipped for an increasingly internationalized and interconnected labor market. And the new vocational education system is structured across different levels from A to E, facilitating the accumulation and recognition of learning outcomes while enabling highly personalized training pathways [46]. This inherent flexibility is crucial for integrating diverse, globally-oriented learning experiences, including those with significant international or intercultural dimensions.

Foreign language learning is actively promoted in vocational education programs at levels C, D, and E. These programs align with the *Common European Framework of Reference for Languages* and explicitly aim to enhance professional communication skills in multilingual, multinational contexts. Regional administrations have the authority to incorporate specialized technical foreign language modules based on specific local industry needs. For example, several vocational education centers in Murcia offer bilingual programs in areas such as commercial activities and administrative management [47]. More specifically, bilingual VET refers to the instruction of professional modules within a training program delivered, in at least one official foreign language of the EU. This bilingual approach does not entail any modification of the officially regulated curriculum. In order to qualify as bilingual education, at least 25% of the total instructional hours must be taught in the foreign language, including at least one module from each academic year of the program. Although Content and Language Integrated Learning (CLIL) methodology is not universally applied across all VET programs, Spain's general promotion of CLIL in education and the availability of CLIL methodology courses for VET teachers indicate a growing trend toward teaching professional subjects through foreign languages, thereby developing dual competencies [48].

Additionally, *Organic Law 3/2022* stipulates the integration of innovation, applied research, and entrepreneurship into VET curricula in explicit terms. This includes promoting the establishment of technology classrooms, strengthening collaboration with enterprises, and fostering "teacher-researcher" roles. TKNIKA, a Basque VET applied research center, fosters innovation in vocational education by connecting applied research, VET institutions, and SMEs. Its Tkgune program develops innovation projects with SMEs, addressing their technological needs and updating VET teachers' skills [49]. This bidirectional knowledge transfer enhances VET centers' technical capabilities and provides SMEs with specialized resources and talent. Furthermore, with such project as innoVET (for the Swiss Center of Vocational Excellence), tools, methods and training courses are developed to promote innovation and internationalization of VET institutions on a structural, cultural and strategic level [50].

In China, the 2023 *Indicators for Building Internationally Influential Vocational Education Standards* established a comprehensive framework for internationalized curriculum development [51]. These standards address digital transformation challenges by requiring enhanced training in digital literacy and sustainable competencies. Structurally, they mandate coherent frameworks and rational modular configurations. Notably, they advocate integrated design methodologies and require bilingual or foreign-language materials with vernacular supplements, ensuring cross-cultural applicability. This approach aims to guarantee global operationalizability and pedagogical efficacy.

In practice, several vocational institutions have successfully adapted international models. Suzhou Chien-Shiung Institute of Technology adopted German standards to establish China's sole AHK German Dual Vocational Education Alliance and developed China's inaugural local Dual VET standards [52]. These cases demonstrate China's evolution from imitation to integration and innovation in international curriculum design.

Similarly, China prioritizes foreign language and intercultural competency development in vocational curricula. The 2021 *English Curriculum Standards for Higher Vocational Education* incorporate core competencies in workplace international communication and multicultural exchange, requiring students to master intercultural knowledge and skills for effective cross-cultural communication [53]. China actively advances the "Golden Courses" initiative, emphasizing digital transformation and application-oriented talent cultivation through diverse teaching modalities [54]:

- Content-Based Instruction (CBI): Organizes instruction around disciplinary knowledge using authentic materials, enabling students to apply language in real contexts.
- EGP-ESP Integration: Combines English for General Purposes with English for Specific Purposes, employing project-based learning and Production-Oriented Approach (POA).
- Outcomes-Based Education (OBE): Centers on students and future professional competencies, reforming teaching methods to enhance professional English capabilities.
- "Post-Course-Competition-Certification" Integrated Teaching Model: Aligns curriculum with workplace demands, assessing outcomes through competitions and certifications.

Moreover, vocational English teaching undergoes digital transformation through the employment of software, platforms, and digital resources to transcend traditional constraints. These initiatives constitute China's systematic approach to cultivating talent with global perspectives and cross-cultural communication competencies.

In conclusion, Spain and China demonstrate distinct yet complementary approaches. Spain emphasizes structural flexibility and competency-based frameworks, integrating global competence through CLIL methodology and applied research centers, while China prioritizes systematic standardization and comprehensive frameworks. Despite methodological differences, both nations share fundamental objectives: cultivating globally competent professionals with cross-cultural communication skills, digital literacy, and industry-relevant expertise.

Table 4: Curriculum Design and Implementation Comparison

Aspect	*Spain*	*China*
System Structure	Flexible levels (A-E) enabling personalized pathways and learning accumulation	Coherent frameworks with rational modular configurations
Language Integration & Teaching Methodology	Foreign language promotion at levels C, D, E aligned with CEFR; 25% minimum bilingual instruction; CLIL with growing adoption	Bilingual/foreign-language materials with vernacular supplements; EGP-ESP integration; CBI, POA, and OBE
Innovation & Digital Integration	applied research centers; teacher-researcher roles; enterprise collaboration; technology classrooms	"Golden Courses" initiative; "Post-Course-Competition-Certification" model; software, platforms, and digital resources
Core Competencies	Professional communication in multilingual contexts; innovation and entrepreneurship	Workplace cross-cultural communication; multicultural exchange

3.4 International Mobility and Skill Updating

Organic Law 3/2022 explicitly promotes participation in international mobility programs for teachers, trainers, students, and professionals to facilitate the exchange of experiences and learning of good practices, thereby fostering commitment and motivation towards the professional sector. Furthermore, the law supports the establishment of Dual VET qualification programs that allow students to simultaneously obtain VET qualifications from both Spain and a partner country, providing advantageous access to higher education and professional activities in both nations [36]. Besides, all individuals' access to high-quality, adaptable vocational training through diverse modalities, as well as ongoing qualification and requalification in accordance with differentiated pathways are guaranteed by the law. This ensures professional competencies acquired through work experience or other non-formal or informal means may be formally identified, assessed, and accredited through the procedure established. Before the law, from 2012 to 2022, only 300,000 workers received accreditation, revealing a gap in a workforce where 48%—about three million people—employ unvalidated skills daily. The integrated *Vocational Training Modernization Plan* (2019-2023) addresses this by targeting over three million validations with an initial budget of €852.5 million, prioritizing sectors like construction, hospitality, and care services [55]. Collectively, these reforms drive a more equitable and adaptive VET system, promoting skill formalization and sustainable economic progress.

As a significant participant in Erasmus+ vocational education programs, the Spanish Service for the Internationalization of Education (SEPIE) actively managing student and staff mobility initiatives. According to European Commission's data, Spain serves as a major destination for incoming Erasmus+ students, and in 2023, the largest numbers of participating organizations in mobility projects came from the VET sector, as well as the most involved organizations in cooperation projects [56]. A cornerstone of Spanish VET is the mandatory workplace training (Formación en Centro de Trabajo - FCT), enabling students to pursue internships across EU member states [57]. These international placements typically span two months to one year, with Dual VET programs extending to 1,200 hours. Students gravitate toward destinations with exemplary Dual VET frameworks: Germany, France, Switzerland, and the Netherlands. Such experiences deliver comprehensive immersion in cross-cultural dynamics, linguistic proficiency, and authentic professional environments, fostering tangible global competence development. Repsol, a trailblazer in Spanish Dual VET, exemplifies this approach by providing students access to genuine international work settings, systematically developing practical global workforce capabilities [58].

More to the point, teacher mobility and continuous professional development in foreign languages and internationalization constitute critical mechanisms for embedding global competence within vocational education [59]. The P.Ir.A.M.iD. project, which Spain's Dual VET system has been actively involved, exemplifies this approach by providing vocational educators with specialized training in intercultural classroom management. Through a multiplier effect leverage, enhanced global competence could be transmitted to broader student populations [60].

Chinese Ministry of Education and seven other departments jointly support vocational institution-enterprise partnerships in international industrial capacity cooperation, establishing flagship events like the Belt and Road International Skills Competition [61]. Regionally, Shandong encourages students to obtain international professional qualifications and enhances policies for faculty exchanges, student study abroad programs, and overseas educational ventures [62]. Guangdong innovates evaluation standards, validating enterprise internal certifications and workplace achievements as key assessment criteria [63]. Overall, this series of policy documents and reform initiatives demonstrates China's official efforts to advance Dual VET through international mobility, skill validation and updating.

One institute in Yunnan establishes overseas project-based classrooms, providing welding skills training to local employees in Laos by innovatively integrating Chinese and Laotian workers into joint learning cohorts [64]. This approach not only imparts technical skills but also facilitates cultural exchange and integration, enhancing participants' collaborative and adaptive capabilities in multinational work environments. Other institutions participate in international vocational skills competitions (such as BRICS Skills Competition), incorporating a "training + certification + competition" model that leverages competition to drive learning, advancing faculty and student skills alignment with international standards, thereby enhancing their global competence [65].

To summarize, China's international mobility programs in vocational education are predominantly project-based at the institutional level, lacking comprehensive frameworks equivalent to Erasmus+. Meanwhile, China's vocational-general education integration continues to face numerous challenges in terms of advancement pathways [66]. The public widely reports that vocational education progression routes remain inadequate, particularly with

limited opportunities for secondary vocational students to advance to undergraduate institutions. General higher education institutions demonstrate low acceptance of vocational school graduates, and a unified national system for "vocational education college entrance examinations" has yet to be established [67].

In comparative terms, Spain's Erasmus+ integration provides systematic international mobility through structured frameworks, including mandatory overseas workplace training and comprehensive teacher exchanges. China adopts a more decentralized approach, implementing various project-based initiatives and regional programs that reflect diverse institutional needs and capacities. While Spain benefits from established European coordination mechanisms, China's model allows for greater flexibility in addressing specific industry and regional requirements. Both systems demonstrate distinct advantages: Spain's framework ensures standardized quality and extensive coverage, while China's approach enables targeted innovation and rapid adaptation to emerging market demands. The effectiveness of each model largely depends on their alignment with respective national contexts and educational system structures.

Table 5: International Mobility and Skill Updating Comparison

Aspect	*Spain*	*China*
Coordination Mechanism	Centralized through SEPIE; systematic skill updating via *Vocational Training Modernization Plan* (2019-2023)	Decentralized approach with project-based initiatives; regional skill updating policies and enterprise-based standards
Mobility Programs	Mandatory EU-wide workplace training (2 months-1 year); systematic teacher development through specialized projects	Project-based overseas training; regional faculty exchanges; limited national coordination
International Partnerships	EU-wide cooperation through Erasmus+; dual qualifications with partner countries	Belt and Road skills exchange platform; bilateral institutional partnerships
Coverage and Scale	Extensive EU-wide network; largest VET sector participation in mobility projects (2023)	Project-based with targeted regional implementation; lacks comprehensive national coverage

4. Discussion

4.1 Key Success Factors from Spain's Experience

The previous section reveals several critical success factors in Spain's Dual VET system that contribute to effective global competence development. First, Spain's systematic integration with European frameworks provides institutional scaffolding that transcends national boundaries. The mandatory EU-wide workplace training requirements, with durations extending up to 1,200 hours, create authentic immersive experiences that develop intercultural communicative competency and collaborative ability simultaneously. This contrasts with China's predominantly project-based approach, which lacks systematic coverage and standardized quality assurance.

Second, Spain's competency-based curriculum framework demonstrates remarkable flexibility in accommodating diverse learning pathways while maintaining rigorous standards. The multilevel structure (A-E) enables personalized progression routes that align with individual career trajectories and industry demands. The integration of CLIL methodology and applied research centers like TKNIKA creates bidirectional knowledge transfer between educational institutions and enterprises, fostering both technical proficiency and global awareness among students and faculty.

Third, the multi-stakeholder governance model in Spain facilitates genuine collaboration rather than governmental dominance. The establishment of vocational committees with balanced representation from unions, employers, educators, and administrators ensures curriculum relevance and industry alignment. This collaborative approach addresses the "hot institutions, cold enterprises" phenomenon frequently observed in China's implementation efforts.

4.2 Transferability and Adaptation Considerations

While direct replication of Spain's model is neither feasible nor desirable given China's distinct socio-economic context, several elements demonstrate strong transferability potential. The competency-based curriculum design framework can be adapted to China's modular education structure, particularly through enhanced emphasis on intercultural communication modules within existing technical programs. The systematic approach to workplace-based learning, while challenging to implement across China's vast geographic expanse, could be piloted in economically developed regions (Jiangsu, Shanghai, Guangdong, etc.) with established international business presence.

However, significant adaptation challenges must be acknowledged. China's centralized governance structure differs fundamentally from Spain's decentralized regional autonomy, potentially limiting stakeholder participation and flexibility. The absence of comprehensive international mobility frameworks equivalent to Erasmus+ constrains opportunities for authentic cross-cultural experiences. Additionally, China's emphasis on knowledge transfer and expertise dissemination, while valuable, may overshadow the development of students' internal global competence if not properly balanced.

4.3 Implementation Barriers and Mitigation Strategies

Several structural barriers impede the direct application of Spain's success factors in China's context. The limited progression pathways from vocational to general higher education restrict students' long-term career mobility, thereby undermining students' motivation and enthusiasm for choosing vocational education and may discourage investment in global competence development. The predominant governmental control over vocational education governance limits genuine industry participation and curriculum responsiveness.

To address these barriers, a phased implementation approach is recommended. Initial pilots in economically advanced

provinces with strong international business presence could demonstrate feasibility and effectiveness before broader scaling. The establishment of regional coordination mechanisms, similar to Spain's provincial governance model, could balance national consistency with local flexibility. Enhanced industry-education collaboration platforms, supported by policy incentives rather than mandates, could gradually increase enterprise engagement without disrupting existing governance structures.

4.4 Limitations and Future Research

This study acknowledges several limitations that warrant consideration. The comparative analysis relies primarily on policy documentation and institutional case studies, with limited empirical data on student outcomes and competence development effectiveness. The temporal dimension of Spain's implementation experience (over a decade) versus China's ongoing reform initiatives creates analytical challenges in assessing comparable developmental stages.

Future research should focus on longitudinal studies measuring global competence development outcomes across different Dual VET models. Empirical investigations of student mobility experiences and their impact on career trajectories would provide valuable insights for program optimization. Additionally, comparative studies of stakeholder engagement mechanisms and their effectiveness in different governance contexts could inform policy refinements.

5. Conclusions and Practical Implications

5.1 Strategic Recommendations for China's Dual VET Enhancement

Drawing from Spain's successful global competence development strategies, several actionable recommendations emerge for China's Dual VET enhancement.

Curriculum and Standards Integration: Develop nationally consistent standards for global competence integration within Dual VET curricula based on Spain's competency-based framework. This includes mandatory intercultural communication modules (minimum 15% of instructional hours), bilingual technical instruction in priority sectors, and systematic integration of digital literacy with cross-cultural collaboration skills through existing curriculum reform initiatives.

Industry Engagement Enhancement: Establish industry-education collaboration councils with balanced representation from government, industry, unions, and educational institutions. These councils would guide curriculum development, workplace training standards, and international partnership strategies, addressing the current government-dominated governance model through systematic enterprise participation incentives.

International Mobility Infrastructure: Develop comprehensive international mobility frameworks through bilateral agreements with advanced Dual VET countries, leveraging existing international cooperation platforms for systematic student and faculty exchanges. Implement standardized assessment frameworks for global competence development while maintaining cultural appropriateness and international comparability.

5.2 Long-term Strategic Implications

The integration of global competence development within China's Dual VET system represents more than educational reform; it constitutes strategic workforce development for China's evolving position in the global economy. As Chinese enterprises increasingly engage in international operations and Belt and Road Initiative projects expand, the demand for globally competent technical professionals will intensify.

Spain's experience demonstrates that systematic global competence development creates positive feedback loops: internationally competent graduates attract multinational enterprises, which in turn demand higher-quality vocational programs, driving continuous improvement. China's adaptation of these principles could accelerate the transition from "made in China" to "created in China" by ensuring technical professionals possess both world-class skills and cultural competencies necessary for global innovation leadership.

5.3 Contribution to Global Dual VET Discourse

This comparative analysis offers a modest contribution to international discourse on Dual VET globalization by examining how national systems might adapt successful practices while preserving institutional integrity. The findings tentatively suggest that effective global competence development requires systematic integration across curriculum design, stakeholder governance, assessment frameworks, and international mobility infrastructure rather than isolated interventions.

The study attempts to highlight the importance of regional economic integration in supporting Dual VET internationalization. Spain's achievements appear inseparable from EU institutional support, suggesting that China may need to create analogous frameworks through regional cooperation mechanisms.

5.4 Final Implications

The comparative analysis reveals that successful global competence development requires alignment between educational innovation and institutional contexts. Spain's achievements result from systematic European integration, multi-stakeholder collaboration, and curriculum flexibility. China's adaptation must account for its governance structure, development patterns, and international engagement strategies.

The path forward involves selective adoption through enhanced industry collaboration and systematic international partnerships. Success will be measured by graduates' demonstrated capacity to navigate cross-cultural professional environments and contribute to global innovation ecosystems. This transformation requires sustained multi-stakeholder commitment and recognition that global competence

development represents an investment in China's long-term economic competitiveness.

Acknowledgement

This work was supported by the 2023 Jiangsu Provincial Higher Education Philosophy and Social Sciences Research General Project (Grant No.: 2023SJYB0767).

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