

Assessing the German Dual Education System: A Basis of Enhancing the Training Model of Shaanxi Polytechnic Institute

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Abstract: The German Dual Education System has long been regarded as an exemplary model for vocational education and training (VET). This study evaluates the implementation of the dual education system at Shaanxi Polytechnic Institute to identify strengths, weaknesses, and areas for improvement. Using a qualitative descriptive research design, data were collected through one-on-one interviews with teachers, students, and company managers involved in the "Order Class" project. Findings indicate that while the dual system at Shaanxi Polytechnic Institute follows a structured framework, significant challenges persist, including the misalignment of theoretical instruction with industry needs, inconsistent industry collaboration, and a lack of standardized evaluation criteria. Recommendations include strengthening industry partnerships, updating curricula to reflect industry trends, increasing the proportion of "Double Qualified" teachers, and enhancing teacher participation in enterprise work. These measures aim to refine the adaptation of the German dual system to China's vocational education landscape, ensuring the production of highly skilled and job-ready graduates. This study provides insights that can guide policy reforms and practical improvements in vocational education in China.

Keywords: Dual Education System; Vocational Education Reform; Work-Based Learning; Teacher Industry Engagement; Educational Policy Adaptation.

1. Introduction

Vocational Education and Training (VET) plays an essential role in ensuring the country's economic viability. The VET curriculum structure emphasizes practical orientation, developing soft skills needed for decent jobs, and preparing students for the labour market (Yusop et al., 2022). In order to develop high-quality VET, it has gradually become a trend for enterprises to deeply participate in VET and form a "school-enterprise joint training" model.

In international terms, Germany is seen as one of the models of a successful country with respect to VET. Skill formation in Germany is typically associated with the dual system of apprenticeship training. Wiemann and Fuchs (2018) considered that dual VET has not only contributed to the prosperity of the German economy, but also improved the vocational quality of the labor force, which is considered Germany's "secret of success". The dual system is much discussed and researched and upheld as a model for countries around the world (Haasler, 2020).

Since the 1980s, China has been studying the theory and practice of VET from Germany. As a consequence, the dual system was gradually imported into China. After more than 30 years of exploration and practice, China has gradually worked out and formed a VET model adapted to its own national conditions, with reforms represented by the "Talent Training Mode of Order Class" in recent years (Chen, 2021). However, compared with the German dual system, many significant challenges still exist in China's VET system, such as disconnect between school training and enterprise demand, low enthusiasm for enterprise participation in running schools, and low proportion of "Double Qualified" teachers (Cui et al., 2023).

As China enters a new stage of development, industrial

upgrading and economic restructuring are accelerating, the demand for skilled workers are getting urgent, the key position and role of vocational education are getting prominent. The Government of China has proposed that by 2035, the overall level of VET in China will be among the top in the world, and a skill-based society will have been basically built. Therefore, it is crucial to assess the current gap with the German dual system and consequently seek for improvements.

In this study, Shaanxi Polytechnic Institute, which is ranked in the top ten of higher vocational colleges in China is selected as the research object, through extensive research and rigorous analysis, the current status of the application of the German dual system in Shaanxi Polytechnic Institute has been evaluated and the current deficiencies have been identified. In addition, some constructive opinions are put forward for the better application of German dual system in Shaanxi Polytechnic Institute, which also provides a reference for improving the quality of vocational education in China.

1.1. Literature Review

VET is a very complex field of both practice and research; it not only encompasses numerous aspects of professional education at the national level (e.g., school-based VET, apprenticeship systems, technical education, work-based learning) but also relates to various actors and stakeholders and consists of different structural elements (Toepper et al., 2022). Consequently, VET constitutes a very diverse and heterogeneous field of practice and research, especially at an international level and from a comparative perspective (Clarke et al., 2021).

At the same time, VET practice has been a relevant and highly topical research issue for many years, driven not least by political reforms, social and economic challenges (such as youth unemployment), and remains present in political

discourse (Caves et al., 2021). In the VET research, Gessler et al. (2020) provided a classification of the various strands of international VET research that distinguishes between six fields: development research, transfer research, European VET cooperation, service research, corporate research, and network research. One of the fields, research on transfer of VET, is a very prominent area for research. The practice of transfer of educational systems and structures has a long historical tradition (Toepper et al., 2021). This is especially true for the transfer of the German dual VET system, which is particularly oriented toward the labour market as well as toward the needs of companies (Haasler, 2020; Rözer & van de Werfhorst, 2020).

In recent years, the question of whether the VET system, and in particular the German VET system, can be transferred or exported to other countries has been studied (Vogelsang et al., 2022). Previous studies have mostly discussed this question at the theoretical-conceptual level and have all come to the same conclusion that dual systems cannot be replicated one-to-one in other countries (Bohlinger & Wolf, 2016; Euler, 2013; Hummelsheim & Baur, 2014). On the contrary, dual system transfers need to be adapted to the national context of the receiving country (Ramasamy & Pilz, 2019). Further, some scholars analysed the fundamental challenges and success factors in the transfer of dual system. Wiemann and Pilz (2019) found that the low social status of VET in many countries (especially developing countries) is a major challenge for the transfer of dual system. Li and Pilz (2023) summarised the success factors of the transfer, including flexible project management, close cooperation among stakeholders, well-established teacher training system, etc. In addition to these theoretical-conceptual discussions, some scholars have explored the practice of the German dual system in their own countries. Oeben and Klumpp (2021) summarised the success factors and impediments of the transfer, using the example of a specific project on the transfer of a dual vocational education and training system from Germany to Tunisia. Jansen and Pineda-Herrero (2019) analysed the impact of the recent introduction of the Dual VET in Spain on students' grades and degree completion, and showed that Dual VET had a positive impact on achievement regardless of the methodology and outcomes used. Maitra et al. (2022) examined the drivers of adoption of the German dual system in India and suggest that the sedimentation, expansion and institutionalization of the policy remain embedded in a bureaucracy-driven centralised and hierarchical framework, thereby limiting much of its transformative promise and potential.

At present, the development of vocational education in China is in the spotlight (Zhu et al., 2022). Since 2017, China has issued a total of thirteen policies and regulations aimed at promoting the high-quality development of vocational education. The dual system is a well-established model that is essential to the current reform of vocational education in China (Chen & Wang, 2023). Unfortunately, however, there is still a gap in international research on the transfer of the dual system to China, and there is a lack of knowledge about the current status of the application of the dual system in Chinese vocational schools. Therefore, there is an urgent need to grasp the current status of applying dual system in Chinese vocational education through extensive research and rigorous analysis, and to explore a dual system path suitable for Chinese vocational education.

1.2. Significance of the Study

Firstly, this study enhances the effectiveness of the German Dual Education System application in Shaanxi Polytechnic Institute by recommending targeted improvement opinions and measures. It is helpful to provide students with vocational skills education that better meets the needs of enterprises.

Secondly, by comprehensively grasping the current landscape of dual education system, teachers in higher vocational colleges can gain an in-depth understanding of the current problems and adjustments, thus helping teachers to improve their teaching methods and enhance their practical teaching ability, and providing references for teachers' training and upgrading in teaching ability in China.

Thirdly, this study provides reference for college president. It helps the school to formulate pragmatic policies, thus enhancing the reputation of Shaanxi Polytechnic Institute and laying a good foundation for promotion to Vocational and Technical University.

1.3. Objectives of the Study

This study aims at providing reasonable suggestions and strategies for dual education system in Shaanxi Polytechnic Institute. Specifically, this study focuses on the following objectives.

1. To describe the current situation of the Dual Education System in Shaanxi Polytechnic Institute along:

- a. implementation
- b. evaluation system

2. To present the suggestions of teachers and students in improving the Dual Education System.

2. Methodology

2.1. Study Design

This study uses qualitative descriptive research design to describe the current situation of the Dual Education System in Shaanxi Polytechnic Institute along implementation and evaluation system. Data had been collected through one-on-one interviews among teachers, students, and companies.

2.2. Population of the Study

The purposive sampling method was used in this study. Since the dual education system involved three parties—teachers, students, and companies—a certain number of samples were selected to be interviewed in each section. The selection process ensured objective and non-discriminatory procedures.

The purposive sampling method guided the selection of participants based on the following inclusion criteria:

1. For teacher: Senior double-qualified teachers. (Top level skill-orientated talent)
2. For student: Have received or are currently receiving the “Order Class” project with a GPA in the top 5% of the class.
3. For Company: The company that cooperates with Shaanxi Polytechnic Institute on the “Order Class” project.

Based on the above inclusion criteria, the researcher selected 2 senior double-qualified teachers, 8 students (4 each from graduated and in school) from the order class programme, and 2 company managers, for a total of 8 participants.

To ensure the study's focus and maintain the integrity of the data, the following exclusion criteria were applied:

1. For teachers: Teachers who are not recognized as senior double-qualified or do not have top-level skill-oriented talent.

2. For students: Students who have not participated in the “Order Class” project or do not have a GPA in the top 5% of their class.

3. For company managers: Managers from companies that do not cooperate with Shaanxi Polytechnic Institute on the “Order Class” project.

The final study population is summarized in the table below:

Table 1. Study population

Type of personnel	Inclusion Criteria	Sample Size
Teachers	Senior double-qualified teachers. (Top level skill-orientated talent)	2 people
Students	Have received or are currently receiving the “Order Class” project with a GPA in the top 5% of the class.	8 people
Company managers	he company that cooperates with Shaanxi Polytechnic Institute on the “Order Class” project.	3 people

The selection process ensured that all participants met the inclusion criteria and that the procedures were objective and non-discriminatory. This approach helped gather relevant and reliable data for the study while respecting the principles of fairness and transparency.

2.3. Data Gathering Procedures

The data collection procedures ensured the anonymity and confidentiality of participants, adhering to ethical standards and the specific requirements of the study.

Before conducting the interviews, the researcher first obtained permission from the dean of the department at Shaanxi Polytechnic Institute. Then, the researcher communicated with 2-3 senior professors for assistance. Upon agreement, the researcher conducted the interviews through face-to-face, telephone, and VooV Meeting. In order to ensure validity, sample teachers were selected for test. Through reliability test, the researcher found out whether the questions set and length of the interviews were appropriate, and then made modifications accordingly. When the interview outline passed the reliability test, interviews were conducted with all the research participants.

The selection of participants followed objective and non-discriminatory procedures. The researcher informed the participants of the intention of the interview in advance to ensure transparency. To guarantee the anonymity of participants, they were given the option to opt for non-disclosure of their identity. Additionally, it was promised to the participants that the data and content obtained would only be used for this research and not for any other purpose, and that all information would be kept strictly confidential, respecting the participants' choice to opt for non-disclosure of information.

2.4. Treatment of Data

The collected data were processed through the thematic analysis method (Braun & Clarke, 2006), specifically in five phases.

Phase1: familiarizing with data. The researcher transcribed data (if necessary), reading and re-reading the data, noting down initial ideas.

Phase2: generating initial codes. The researcher coded interesting features of the data in a systematic fashion across

the entire data set, collating data relevant to each code.

Phase3: Generating themes. In this phase, the researcher organized and summarized the existing codes and groups different codes under different potential themes.

Phase4: Defining and naming themes. Through further analysis, the researcher identified an appropriate name for each theme to allow readers to intuitively understand what the theme is about.

Phase5: Producing the report. The researcher made conclusive statements about the content of the data.

3. Results and Discussion

This section presents the data gathered through interview.

3.1. Current Situation

Implementation

The implementation of the dual education system at Shaanxi Polytechnic Institute has followed a structured approach, integrating classroom learning with industry-based training. However, despite efforts to create a seamless transition from academic instruction to hands-on experience, various challenges persist. This section examines how the dual education system is being implemented, highlighting both its strengths and areas requiring improvement.

Table 2. Implementation of the Dual Education System

Themes	Participants
Structured approach to dual education	Teacher 1, Teacher 2, Company Manager 1
Industry collaboration in training programs	Teacher 1, Company Manager 2, Company Manager 3
Challenges in aligning theoretical and practical training	Student 1, Student 3, Teacher 2

Structured approach to dual education. The implementation of the Dual Education System at Shaanxi Polytechnic Institute is recognized as structured and well-established. Teachers and company managers acknowledge that the system provides a combination of classroom instruction and workplace training. Teacher 1 and Company Manager 1 specifically highlighted the progress made in structuring the curriculum to align with industry requirements. This supports the findings of Xu and Wang (2023), who argue that well-structured dual education models in China create stronger links between vocational institutions and enterprises.

Industry collaboration in training programs. However, despite a structured approach, industry collaboration remains inconsistent across different programs. Company Manager 2 and Teacher 1 noted that while some companies are actively involved in curriculum development and student training, others participate only minimally. This variation leads to differences in student preparedness for industry work. Scholars like de Amesti et al. (2023) have argued that the Dual Education System models function best when companies see long-term value in investing in student training.

Challenges in aligning theoretical and practical training. One of the most pressing issues identified was the misalignment of theoretical lessons with practical training, which was raised by Student 1, Student 3, and Teacher 2. Students noted that some practical training components do not reflect real industry challenges, making it difficult for them to

transition from academic settings to the workplace. This is consistent with Rong and Liu (2023), who found that many Chinese vocational education programs struggle to synchronize classroom learning with workplace realities. Addressing these challenges requires better coordination between academic and practical training, standardized partnerships between industry and educational institutions, and continuous feedback loops between students, teachers, and company mentors.

3.2. Evaluation System

A well-defined evaluation system is crucial for measuring the effectiveness of the dual education system. At Shaanxi Polytechnic Institute, student assessment includes both academic performance and practical skill evaluation. However, inconsistencies in assessment methods among industry partners create gaps in evaluating student competency. This section discusses the existing evaluation system and explores strategies for establishing more standardized and effective assessment criteria.

Table 3. Evaluation System of the Dual Education System

Themes	Participants
Current assessment methods used	Teacher 1, Teacher 2, Company Manager 1
Need for standardized evaluation criteria	Student 5, Student 7, Company Manager 2
Industry involvement in student assessment	Teacher 2, Company Manager 3, Student 8

Current assessment methods used. The evaluation system in the Dual Education System at Shaanxi Polytechnic Institute currently lacks a standardized assessment framework. Teachers and company managers confirmed that while students undergo both academic and practical assessments, the criteria for evaluating industry-based training are inconsistent across different companies. Teacher 1 and Teacher 2 stated that schools rely on internship supervisors' reports, while Company Manager 1 indicated that companies often conduct informal assessments rather than structured evaluations. This aligns with the findings of Wang and Xu (2024), who noted that many vocational education systems in China lack standardized performance evaluation metrics.

Need for standardized evaluation criteria. Another major concern raised by Student 5, Student 7, and Company Manager 2 was the need for a standardized evaluation system that includes both academic and industry-based performance indicators. Without uniform assessment criteria, students may not receive fair and consistent evaluations, leading to gaps in their skill certification. The research of Kalenskyi et al. (2023) also emphasizes the importance of competency-based assessments in dual education systems, ensuring students meet industry standards.

Industry involvement in student assessment. Additionally, Teacher 2, Company Manager 3, and Student 8 emphasized that increasing industry involvement in student assessment would lead to more accurate evaluations. Many students currently receive performance feedback from teachers but lack detailed industry evaluations, which could better reflect their preparedness for employment. To improve this, developing a standardized competency-based evaluation system, incorporating industry-led evaluations, and implementing structured feedback systems between companies and schools would ensure assessments reflect

actual workplace competencies.

Suggestions for Improving the Dual Education System

Enhancing the dual education system requires targeted improvements in industry collaboration, curriculum development, and teacher training. By addressing these key areas, Shaanxi Polytechnic Institute can better prepare students for the demands of the modern workforce. This section presents actionable recommendations based on research findings, focusing on strengthening industry partnerships, aligning curricula with industry needs, and improving teacher engagement in enterprise work.

Table 4. Suggestions for Improving the Dual Education System

Themes	Participants
Strengthening industry partnerships	Student 1, Teacher 3, Company Manager 1
Enhancing practical training to match industry needs	Student 3, Teacher 2, Company Manager 2
Updating curriculum based on industry trends	Student 5, Teacher 1, Company Manager 3
Enhancing teacher competence and industry engagement	Teacher 1, Teacher 2, Teacher 3
Increasing the percentage of "Double Qualified" teachers	Teacher 1, Teacher 2, Company Manager 2
Encouraging teachers to participate in enterprise work	Teacher 2, Teacher 3, Company Manager 1

Strengthening industry partnerships. One of the most widely recommended improvements was strengthening industry partnerships. Student 1, Teacher 3, and Company Manager 1 emphasized that closer collaboration between the institute and industry partners would ensure that practical training remains relevant and that students receive hands-on experience with up-to-date industry practices. This finding aligns with Sun et al. (2023), who found that well-integrated industry partnerships in dual education significantly improve graduate employability.

Enhancing practical training to match industry needs. Additionally, Student 3, Teacher 2, and Company Manager 2 suggested that practical training should better reflect industry needs. Several students reported that the skills they learned in school were outdated or not aligned with current job market demands. Similar findings were reported by Qin et al. (2023), who highlighted that many vocational institutions in China lag behind in updating their curriculum to match evolving industry trends.

Updating curriculum based on industry trends. A significant number of participants—Student 5, Teacher 1, and Company Manager 3—stressed the importance of regular curriculum updates to incorporate new technologies and industry methodologies. As industries become more technology-driven, vocational institutions must adapt their curricula to equip students with future-ready skills.

Enhancing teacher competence and industry engagement. A key teacher-related recommendation that emerged from the data was enhancing teacher competence and industry engagement, which includes improving teacher training, increasing the proportion of "Double-Qualified" teachers, and encouraging teachers to participate in enterprise work. Teacher 1, Teacher 2, Teacher 3, Company Manager 1, and Company Manager 2 emphasized the need for teachers to receive continuous professional development through industry training programs, ensuring that their knowledge remains aligned with industry advancements. Chang (2024)

found that teachers who undergo regular industry exposure are more effective in delivering practical, skills-based education.

Increasing the percentage of “Double-Qualified” teachers. Increasing the percentage of “Double-Qualified” teachers—educators with both academic qualifications and extensive industry experience—was seen as another crucial improvement. Teacher 1, Teacher 2, and Company Manager 2 argued that having more teachers with direct industry experience would bridge the gap between theoretical instruction and practical application. Research by Luo (2024) indicates that vocational education institutions with a higher percentage of “Double Qualified” teachers produce graduates who are better prepared for the workforce.

Encouraging teachers to participate in enterprise work. Additionally, encouraging teachers to participate in enterprise work was strongly recommended. Teacher 2, Teacher 3, and Company Manager 1 suggested that teachers should be given opportunities to work part-time in companies or undergo short-term industry placements to stay updated with the latest industry trends and integrate real-world applications into their teaching. This model has been successfully implemented in Germany, where vocational educators are required to have regular industry exposure (Kodirov Ismail, 2024).

4. Conclusion

The findings of this study reaffirm that while Shaanxi Polytechnic Institute has made progress in implementing the German dual education system, significant areas for improvement remain. A well-structured dual education model requires strong industry partnerships, continuous curriculum updates, and a faculty equipped with both academic knowledge and practical experience. Addressing these aspects will enhance student employability and ensure that vocational education aligns with labor market demands.

Furthermore, the need for a standardized evaluation system and active industry participation in student assessment cannot be overlooked. Creating clear performance metrics and competency-based assessments will ensure that students graduate with skills that meet industry expectations.

As China continues to advance its vocational education system, a more refined adaptation of the German dual education system will contribute to the development of a highly skilled workforce. By fostering collaboration between academia and industry, improving teacher training, and refining evaluation systems, Shaanxi Polytechnic Institute can set an example for vocational education institutions across China. Future research should explore the long-term impact of these improvements and examine policy interventions that further support the integration of industry-driven vocational training models.

5. Recommendations

Strengthening industry partnerships is essential for the continued success of the dual education system. Establishing long-term agreements with enterprises will ensure continuous collaboration in student training. Companies should take a more active role in curriculum design and student assessment to align theoretical knowledge with practical skills. Financial incentives and government subsidies can encourage corporate participation in vocational education, fostering a more sustainable industry-education partnership.

Enhancing practical training to match industry needs

requires implementing regular industry-based training sessions to keep students updated with current market demands. Increasing the number of practical training hours and ensuring that students are exposed to real-world industry settings will improve their readiness for employment. Stronger mentorship programs, where industry experts guide students throughout their training, can further bridge the gap between education and the workplace.

Updating the curriculum based on industry trends is crucial for maintaining relevance. Conducting annual curriculum reviews in collaboration with industry stakeholders will ensure alignment with emerging technologies and workforce demands. Digital tools and smart logistics technologies should be integrated into training modules to reflect advancements in the logistics industry. Providing students with interdisciplinary knowledge by incorporating elements of business management, data analytics, and sustainability into the curriculum will enhance their career prospects.

Enhancing teacher competence and industry engagement is another vital step. Establishing mandatory industry immersion programs for teachers will help them stay updated with industry practices. Joint training programs between vocational institutions and enterprises for both teachers and students can facilitate knowledge exchange. Specialized training programs should be developed to help teachers integrate experiential learning methods into their instruction, ensuring that students receive industry-relevant education.

Increasing the percentage of “Double Qualified” teachers will strengthen the overall quality of vocational education. Policies should be implemented to recruit professionals with industry experience into teaching positions. Government-funded certification programs can help existing teachers gain industry-recognized qualifications, and vocational teachers should be encouraged to undertake professional certifications relevant to their field of instruction.

Encouraging teachers to participate in enterprise work will further bridge the gap between academia and industry. Establishing a sabbatical program allowing teachers to work in enterprises for a fixed period while retaining their teaching positions will enhance their practical knowledge. Part-time work opportunities within industry partners should be introduced, and research collaborations between teachers and enterprises should be promoted to foster innovation and real-world application of educational concepts.

By implementing these recommendations, Shaanxi Polytechnic Institute can further enhance the effectiveness of its dual education system and contribute to the broader improvement of vocational education in China. These strategies aim to bridge the gap between education and industry, ensuring that graduates are well-prepared for the evolving job market.

References

- [1] Böhlinger, S., & Wolf, S. (2016). Zwischen Dynamik und Stagnation. Politiktransfer kooperativer Berufsausbildung als Weg aus der Jugendarbeitslosigkeit in Südeuropa. *Zeitschrift für Pädagogik*, 62(3), 340-357. <https://doi.org/10.25656/01:16762>.
- [2] Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77-101. <https://doi.org/10.1191/1478088706qp0630a>.
- [3] Caves, K. M., Baumann, S., & Renold, U. (2021). Getting there from here: a literature review on vocational education and training reform implementation. *Journal of Vocational*

- Education & Training, 73(1), 95-126. <https://doi.org/10.1080/13636820.2019.1698643>.
- [4] Chang, X. (2024). The Construction of “Dual-qualified” Teaching Staff in Vocational Colleges under the Background of High-quality Development: Progress, Dilemma and Breakthrough Paths. *Vocational and Technical Education*, 45(07), 58-64.
- [5] Chen, H. (2021). Talent Training Mode of Order Class in Higher Vocational Colleges Under the Background of Industry-education Integration. *Education and Vocation*(02), 45-48. <https://doi.org/10.13615/j.cnki.1004-3985.2021.02.011>.
- [6] Chen, Y., & Wang, J. (2023). How to Make the Transboundary Possible: Study of the Governance for Dual Bachelor Programs in Germany. *Fudan Education Forum*, 21(05), 120-128. <https://doi.org/10.13397/j.cnki.fef.2023.05.013>.
- [7] Clarke, L., Westerhuis, A., & Winch, C. (2021). Comparative VET European research since the 1980s: accommodating changes in VET systems and labour markets. *Journal of Vocational Education & Training*, 73(2), 295-315. <https://doi.org/10.1080/13636820.2020.1858938>.
- [8] Cui, Z., Chen, P., & Ni, J. (2023). Policy Formulation of China’s Vocational Education: Basic Logic, Practical Problems and Countermeasures. *Journal of Southwest University (Social Sciences Edition)*, 49(03), 167-177. <https://doi.org/10.13718/j.cnki.xdsk.2023.03.014>.
- [9] de Amesti, J., Bordón, P., & Bolli, T. (2023). Dual TVET education in Chile: why do companies train students? *Journal of Vocational Education & Training*, 75(5), 1013-1032. <https://doi.org/10.1080/13636820.2021.1995468>.
- [10] Euler, D. (2013). Die deutsche Berufsausbildung – ein Exportschlager oder eine Reformbaustelle? , 109(3), 321-331. <https://biblioscout.net/article/99.140005/zbw201303032101>.
- [11] Gessler, M., Bohlinger, S., Zlatkin-Troitschanskaia, O., Toepper, M., Steinert, M., Biess, A., Kühling-Thees, C., & Scheuch, I. (2020). Schwerpunkte der Förderinitiative “Internationalisierung der Berufsbildungsforschung”(IBBF) des Bundesministeriums für Bildung und Forschung. *Kölner Zeitschrift für Wirtschaft und Pädagogik*, 69(2), 7-28. <https://www.researchgate.net/publication/351659804>.
- [12] Haasler, S. R. (2020). The German system of vocational education and training: challenges of gender, academisation and the integration of low-achieving youth. *Transfer: European Review of Labour and Research*, 26(1), 57-71. <https://doi.org/10.1177/1024258919898115>.
- [13] Hummelsheim, S., & Baur, M. (2014). The German dual system of initial vocational education and training and its potential for transfer to Asia. *PROSPECTS*, 44, 279-296. <https://doi.org/10.1007/s11125-014-9311-4>.
- [14] Jansen, A., & Pineda-Herrero, P. (2019). Dual Apprenticeships in Spain – Catalonia: The Firms’ Perspective. *Vocations and Learning*, 12(1), 129-154. <https://doi.org/10.1007/s12186-018-09217-6>.
- [15] Kalenskyi, A., Gerliand, T., Kravets, S., Homeniuk, D., & Nagayev, V. (2023). Dual Educational System of Professional Training of Future Skilled Workers. *Advances in Design, Simulation and Manufacturing VI*, Cham.
- [16] Kodirov Ismail, N. (2024). DUAL EDUCATION IN THE TRAINING OF QUALIFIED ENGINEERING PERSONNEL IN TECHNICAL FIELDS IS THE BASIS OF THE NEW INNOVATIVE EDUCATIONAL SYSTEM. *European Journal of Pedagogical Initiatives and Educational Practices*, 2(2), 33-38. <https://europeanscience.org/index.php/4/article/view/455>.
- [17] Li, J., & Pilz, M. (2023). International transfer of vocational education and training: a literature review. *Journal of Vocational Education & Training*, 75(2), 185-218. <https://doi.org/10.1080/13636820.2020.1847566>.
- [18] Luo, Y. (2024). Difficulties and Paths in the Construction of “Double-qualified Teacher” Teaching Innovation Teams under the Background of High-quality Development. *Vocational and Technical Education*, 45(20), 57-60.
- [19] Maitra, S., Maitra, S., & Thakur, M. (2022). Uncertain itineraries: dual system of training and contemporary TVET reforms in India. *Journal of Vocational Education & Training*, 1-20. <https://doi.org/10.1080/13636820.2022.2042724>.
- [20] Oeben, M., & Klumpp, M. (2021). Transfer of the German Vocational Education and Training System—Success Factors and Hindrances with the Example of Tunisia. *Education Sciences*, 11(5), 247. <https://doi.org/10.3390/educsci11050247>.
- [21] Qin, H., Wang, S., & Yin, J. (2023). Research on Curriculum Reform of School Enterprise Dual Career Planning Based on Employment Needs of Enterprises. *Journal of the Open University of Fujian*(05), 32-35.
- [22] Ramasamy, M., & Pilz, M. (2019). Competency-based curriculum development in the informal sector: The case of sewing skills training in rural South India. *International Review of Education*, 65(6), 905-928. <https://doi.org/10.1007/s11159-019-09810-4>.
- [23] Rong, Y., & Liu, Y. (2023). Enterprise Side’s Organizational Structure of German Dual Vocational Training System. *Tsinghua Journal of Education*, 44(02), 120-127. <https://doi.org/10.14138/j.1001-4519.2023.02.012008>.
- [24] Rözer, J., & van de Werfhorst, H. G. (2020). Three Worlds of Vocational Education: Specialized and General Craftsmanship in France, Germany, and The Netherlands. *European Sociological Review*, 36(5), 780-797. <https://doi.org/10.1093/esr/jcaa025>.
- [25] Sun, F., Shao, J., & Xu, Z. (2023). The Formation Mechanism and Influence Effects of German “Dual System” Vocational Education Model--Also on the Exploration and Trend of China’s Vocational Education Model. *Vocational and Technical Education*, 44(09), 70-76.
- [26] Toepper, M., Zlatkin-Troitschanskaia, O., & Kühling-Thees, C. (2021). Research in International Transfer of Vocational Education and Training – A Systematic Literature Review. *International Journal for Research in Vocational Education and Training*, 8(4), 138-169. <https://doi.org/10.13152/IJRJET.8.4.7>.
- [27] Toepper, M., Zlatkin-Troitschanskaia, O., & Kühling-Thees, C. (2022). Literature review of international empirical research on transfer of vocational education and training. *International Journal of Training and Development*, 26(4), 686-708. <https://doi.org/https://doi.org/10.1111/ijtd.12276>.
- [28] Vogelsang, B., Röhrer, N., Pilz, M., & Fuchs, M. (2022). Actors and factors in the international transfer of dual training approaches: The coordination of vocational education and training in Mexico from a German perspective. *International Journal of Training and Development*, 26(4), 646-663. <https://doi.org/https://doi.org/10.1111/ijtd.12279>.
- [29] Wang, X., & Xu, G. (2024). Towards the Measurement System Construction of High-quality Development Level of Vocational Education in China. *Vocational and Technical Education*, 45(15), 18-24.
- [30] Wiemann, J., & Fuchs, M. (2018). The export of Germany’s “secret of success” dual technical VET: MNCs and multiscalar stakeholders changing the skill formation system in Mexico. *Cambridge Journal of Regions, Economy and Society*, 11(2), 373-386. <https://doi.org/10.1093/cjres/rsy008>.

- [31] Wiemann, K., & Pilz, M. (2019). Welche Faktoren beeinflussen die Übertragung dualer Ausbildungsansätze ins Ausland? *Zeitschrift für Berufs- und Wirtschaftspädagogik*, 115(3), 420-446. <https://doi.org/10.25162/zbw-2019-0018>.
- [32] Xu, L., & Wang, Z. (2023). Analysis of the Connotational Characteristics and Motivation of the Dual Study Programme of the University of Applied Sciences in Germany. *China Higher Education Research*(05), 71-78. <https://doi.org/10.16298/j.cnki.1004-3667.2023.05.11>.
- [33] Yusop, S. R. M., Rasul, M. S., Mohamad Yasin, R., Hashim, H. U., & Jalaludin, N. A. (2022). An Assessment Approaches and Learning Outcomes in Technical and Vocational Education: A Systematic Review Using PRISMA. *Sustainability*, 14(9), 5225. <https://doi.org/10.3390/su14095225>.
- [34] Zhu, S., Meyer, W., & Röhrig, S. (2022). The typology of vocational education and training cooperation between Germany and China. *International Journal of Training and Development*, 26(4), 709-724. <https://doi.org/10.1111/ijtd.12283>.