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Research Article

The Study on the Change of School-enterprise Cooperation Policy in China's Vocational Education

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ABSTRACT

The models of school-enterprise cooperation for vocational education in China, Europe, and the United States are compared in this paper. The development of the workforce, teacher preparation, and skilled labor are the main concerns. An extensive evaluation of the literature and case study analysis was used to perform the research. According to the findings, there are certain parallels and variations between the school-enterprise cooperation models in China, Europe, and the United States. For the analysis of this research, a sequential mixed technique (qualitative and quantitative) study was conducted. Information was acquired from the targeted set of university faculty members via a questionnaire. Delphi questionnaires were used twice to conduct the study. Information was acquired from the targeted set of university faculty members via a questionnaire. Delphi questionnaires were used twice to conduct the study. Data from the semi-structured interviews for the qualitative study were collected via a Delphi survey, and 14 nodes and six themes were then generated. The study's most important findings included the following: social and economic development, employee motivations, short-term training programs, support for industrial development, and information technology as a tool for knowledge dissemination and for developing learning opportunities for vocational education. For further debate, this study also identified these consensuses across the targeted populations of faculty of vocational institutions (China, Europe, and America). This study's insights on the school-enterprise cooperation models of vocational education in China, Europe, and the United States could help shape policy and increase the efficacy of this field of study.

Keywords: School-Enterprise Cooperation, Vocational Education, Skilled Workers, Teachers' Training and Workforce Development.

INTRODUCTION

Vocational education may best sustain collective and financially viable growth is a major interest to the direction during this time of trade and industry change at the start of this new century as the state moves from a command economy to a more responsive and market-oriented (Lumby, 2005). Vocational education just focuses on differentiating characteristics and has overlooked "customer" requirements. Many schools' curricula don't align with kids' developmental objectives, which degrades the quality of their talent development(Jacobs & Hawley, 2009; Shi, 2013). China emphasizes education and has made significant investments in its educational infrastructure. The country has made significant progress in accessing primary and secondary education, and more attention has been paid to higher education and vocational training. To start, under Chinese policies on collaboration, three concepts of production, education integration, school-enterprise cooperation, and work-study

are employed interchangeably (Choi, 2021; Velde, 2009). The definitions of the aforementioned three ideas are shared by less often used concepts like school-industry cooperation and the merger of production and education. These ideas show varying degrees of collaboration, but they all work towards the same goal of connecting vocational education and the labor market (Sang, Valcke, Braak, & Tondeur, 2010; Zhou, 2023). In China, the education system has been divided into several lists, including primary, secondary and thriller education. Various institutions play an important role in providing education, such as schools, colleges and universities. Vocational education and training institutions, in particular, provide special training for students to equip specific technical skills and knowledge related to different industries. Concern about how efficiently workforce development programs connect disadvantaged clients to high-quality jobs in the labor market has grown in the wake of welfare reform, which made a bold move towards tying individual well-being with the capacity to find gainful employment (Cooney, 2011). Vocational education focuses on equating individuals with practical skills and competencies according to specific professions or industries. This is important for bridging the gap in skills in the labor market and promoting economic growth. The influence of career development interventions on organizational productivity, efficiency, and competitiveness was a major emphasis of many of the studies we assessed (Jeong & Lee, 2021). These emphasized the advantages of workforce development for employers while ignoring or underplaying the implicit incentives for employees to participate in learning at/for work (Khan, Hassan, Fahad, & Naushad, 2020). The research team concluded that the study's main focus should have been on "employee benefits" rather than "employer benefits," despite some people's arguments to the contrary (Hughes, Bimrose, Barnes, Bowes, & Orton, 2005). The formal institutions only contribute a relatively small percentage of the total growth in the skilled labor force, and they often do not create workers of the required caliber or quantity (Vakola, 2013). It is anticipated that the establishment of skill development councils, and employer-led organizations be established in each province to analyze training needs and satisfy those needs by establishing training agreements with both public and private sector training providers (Kemal, 2005; Edwards & I'Anson, 2022). Surveys of teachers and students show that they did not integrate computers into their curriculum(Bulman & Fairlie, 2016). This study has the objective is as to examine the impact of school-enterprise cooperation models of vocational education in China and European and American countries.

LITERATURE REVIEW

Since the 1980s, China's vocational education has been influenced strongly by its planned financial system. Vocational education aims to arrange and teach the workforce for economic growth based on the associated "personnel plan" of the administration (Ibrahim & Aljneibi, 2022). The management develops a "human resource plan" supported by its expansion plan for the economy (Lumby, 2005). In comparison to the majority of other European nations, the English labor market delivers extremely high returns to degrees, both absolute and relative. Additionally, it provides very poor returns for low-level vocational credentials acquired through training programs or educational institutions(Jaenecke, Coombe, Harrison, King, & Robinson, 2023; Wolf, 2011). The process authors' philosophy and discussion about potential future developments of responsiveness by indicating past and present vocational education to aid at the beginning of vocational education attitude in a country that essentially takes ups before beginning to undergo repeated, rapid change(Masturah, Mariatin, Danta, & Ginting, 2018; Schmidtke & Chen, 2012). The obligation of the government to set a fraction of vocational education is impacted by this in terms of its policy relevance. It is also crucial that vocational education must be employment-oriented in official announcements and public awareness campaigns(Auletto, 2021; Shi, 2013). The first wave of theoretical analyses in this literature came in the 1960s and 1970s. These studies begin with the reasonable supposition that competent employees increase productivity in those around them, provide crucial services, and are frequently publicly trained and compensated (Chen, Yeh, & Madsen, 2019). Therefore, their expulsion from a nation should hinder economic development and productivity, deprive victims of services, and drain the public coffers by driving up the salaries of seasoned government employees and necessitating public spending to train their replacements(Clemens, 2011). A parallel body of study examines how employees move between areas. It has been disputed that shifting employees among companies provide a proper system for labor market selection, concentration, and knowledge(Iqbal, Hassan, Mahmood, & Tanveer, 2022). When a performance happens, one is likely to accomplish work-related goals, plan to get ready for impending duties and draw motivation from recently finished work to come up with original solutions to difficulties. We argue that employees hold in performance, such thinking is advantageous for the performance of tasks, even though there is a chance that not only thinking will always be problem-focused but also emotion-focused a form of daydreaming linked with adverse task performance (Trivedi & Pattusamy, 2023). The ability composition of the moves has been considered in more recent studies. Spillover effects have been associated with competent employees' and researchers'/inventors'

movement in particular(Fratesi, 2014; Sheldon & Wallace, 2014). Training is the key component of new hiring for the development of skills with little competence to secure the larger post to be filled; tough positions necessitate stronger search efforts(Cross & Israelit, 2021). A new employee could require extra off-the-job training to maximize efficiency, and it typically takes some time for them to acclimatize to vacant positions in a new organization (Blatter, Muehlemann, & Schenker, 2012). However, jobs that only require on-the-job training or related work experience were predicted to grow at a slower rate than those requiring some postsecondary certification (Cooney, 2011; Hughes et al., 2005). Federal financing has historically played a significant role in workforce development interventions, with much of it going towards short-term training programs and very little of it including interaction or collaboration among colleges (Leary, Reilly, & Brown, 2009). Adoption and use of technology require constant work in addition to financial resources. This paper's central thesis is that student learning outcomes are teachers' and educational systems' top priority. When and only when they are certain that there will be significant benefits in terms of student learning outcomes, the majority of educators will make the effort required to integrate technology into education (Means, 2010). Individuals' goal orientations and contents are just two of the many elements involved in goal pursuit. The understanding of learners who are motivated to acquire knowledge and abilities in the workplace can be developed by taking a deeper look at goal orientations and contents from the perspective of human resource improvement and education. Because of this, research on the common placement between objectives and transfer to the amount of knowledge about instruction motivation (Gegenfurtner, 2019). The colleges' efforts to enhance, modernize, or develop their workforce development programs were often attentive to short-term local enhancement due to the increasingly few resources available (Zenebe Lema, 2017). This led to competition over scarce resources and a noticeable variance in the quality of these programs (Fox, 2015).According to research, academic leaders need a variety of leadership abilities in order to be more effective in their positions. Faculty members, such as department heads, chairmen, and faculty deans, play a significant role in ensuring that their duties are properly carried out in universities since they produce assets (students) that are crucial to society's well-being and the future economic development of the country(Haider, Akbar, Tehseen, Poulova, & Jaleel, 2022). Workforce development now refers to a diverse variety of national and international policies and initiatives that are concerned with preparing people for the workforce. There doesn't seem to be a single justification for why professional groups and governments should use workforce development to describe such a diverse range of endeavors or in a variety of contexts (Jacobs & Hawley, 2009). This is a real need to evaluate how work affects sleep and how sleep impacts work performance in America, especially given that a significant portion of the population is experiencing a sleep disorder that workdays are getting extended and that technology causes us to work from home at any time during the 24 hours a day (Swanson et al., 2011). Feedback from experienced instructors is frequently used in teacher professional development programs to enhance the teaching methods of new teachers in the context of Chinese vocational education and training. In China, local education committees frequently bestow the title of "expert teacher" on educators who have made great contributions to the field of education and have a wealth of knowledge. Lesson observations, novice expert contacts, teacher apprenticeships, and master-teacher studios are all pertinent activities that are carried out in programs in China. According to research, these activities enhance both the instructional skills of beginning instructors and the academic achievement of their pupils (Jin, Tigelaar, Van der Want, & Admiraal, 2022). Some unobservable influences where foreigners live in the various European nations may be related to unobservable influencing the development of patents or published documents(Christensen & Knezek, 2002). If immigrants, especially talented immigrants, take advantage of economic possibilities in their new nations, there will be a non-zero correlation between economic outcomes and the percentage of immigrants who are (skilled), which will skew the calculated coefficient for such a share. Due to measurement inaccuracy in the share of (skilled) foreigners, there is a second source of bias (Bosetti, Cattaneo, & Verdolini, 2015). Following the implementation of this policy, the government began using the proportion of learners in establishment and vocational education as a key guidance to assess the progress of vocational education in all regions(Lumby, 2005). Employers might have preconceived notions about the type of education itself. For example, they might favor candidates with a vocational education because they can start working right away with little additional training thanks to their technical expertise in a given field and the likelihood that they have worked in the field before. While providing less value in the short term, general education may indicate higher academic achievement, better potential, and greater flexibility as a worker. It may also be a better long-term investment (McDonald & Korber, 2023).

METHODOLOGY

To get beyond the single design's limitations, the study design presented in this section uses both narrative (a sort of qualitative approach) and quantitative methods (i.e. a Delphi survey).By using the narrative technique, the data (i.e. semi-structured interviews) were gathered from the targeted population. Following the screening of raw data using qualitative analysis, 14 nodes were extracted. Later, the importance level of identified components (themes) was evaluated and prioritized using the quantitative techniques (two-round Delphi Survey) from the target population. **Figure 1** shows the structure of this study and how divided the study into two parts (qualitative and quantitative). With the aid of statistical tools, nodes were generated from the data that had been recorded on audiotapes using this method. Expert advice was also a key component of this process. From the chosen semi-factors (nodes), a total of eight significant themes were chosen. The themes that were found were used once more for quantitative analysis, but this time a questionnaire based on a five-point Likert scale was created to collect information from the target population such as the faculty of vocational education. There are 25 main open-ended questions made up of the instrument (questionnaire) used for the semi-structured interviews. Using the pilot survey, the experts in the field of academia validated these open-ended questions. There were each institution has one department. **Table 1** below represents the eight vocational institutions and 8 departments.

Table 1. Vocational Education in Chinese, European and American Countries

Departments	Vocational Institutions	Departments	Vocational Institutions
Electric	Vocational Institution 1	Economics	Vocational Institution 5
Computer	Vocational Institution 2	Electronics	Vocational Institution 6
Civil	Vocational Institution 3	Mechanical	Vocational Institution 7
Automobiles	Vocational Institution 4	Cyber security	Vocational Institution 8

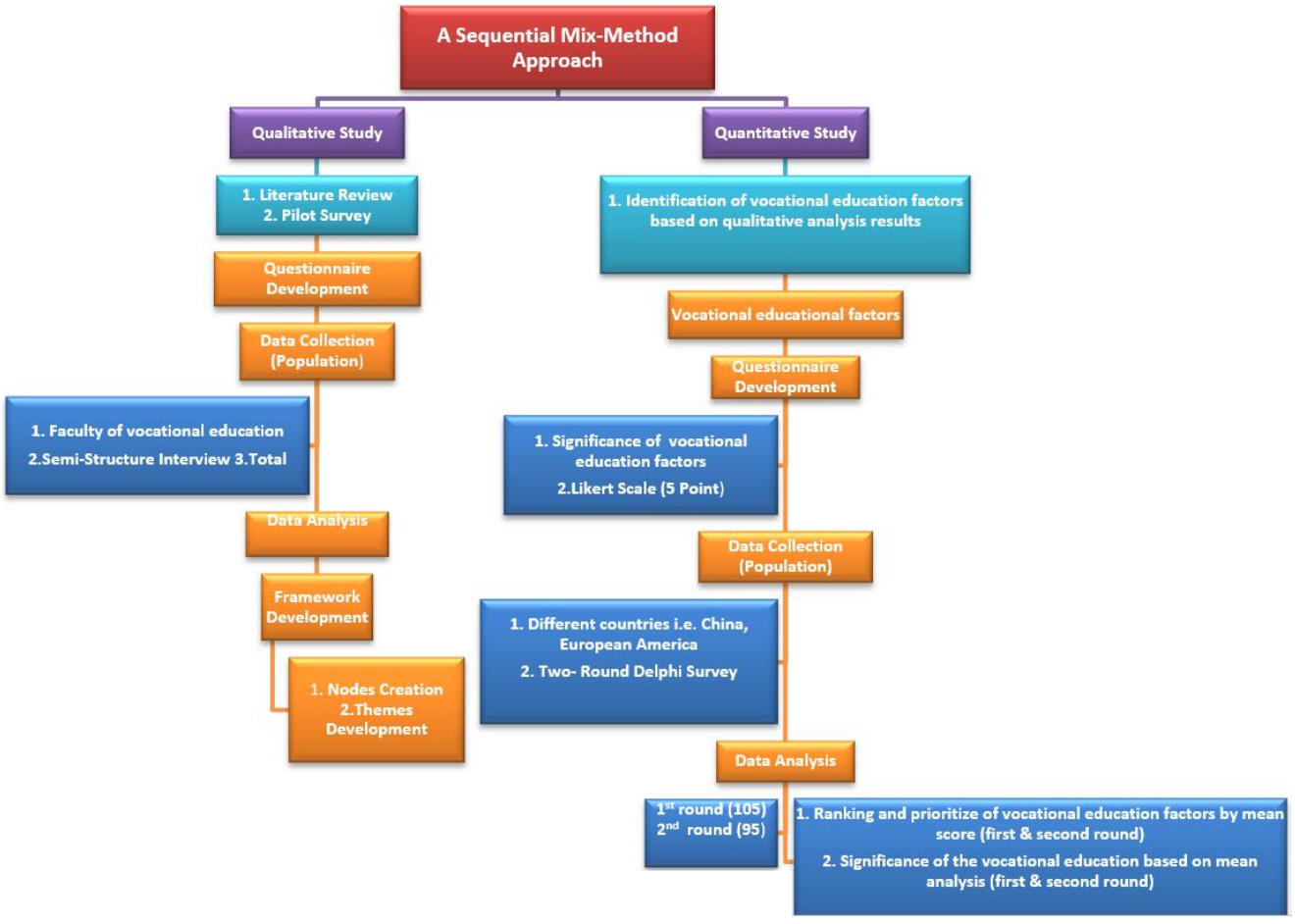

Figure 1. The Research Methodology Adopted for the Study

A total of 105 replies were gathered in the initial round. The distribution of the respondents and their range of experiences are shown in **Table 2**. In the initial round postal mail (printed instruments) and in-person meetings were used to collect the data. To obtain more accurate findings, the respondents' identities were kept a secret from one another. The round was repeated until a consensus was reached, at which point the respondents were informed of the desired statistical results. The initial round of data collection was done. To determine whether the responder groups had reached a consensus or not, the data gathered from the first round were statistically analyzed. Using the online survey, the mean score for the second round was determined and presented to the respondents. The responders were given the option to keep or modify their initial grading, and this decision was left up to them. However, for this round, the replies dropped to 95, as indicated in **Table 2**, with their distribution being made up of China(43), America (31), and European Countries(21). When the respondent group reached an agreement, the Delphi survey was terminated. The following part contains the analysis of the data's findings.

Table 2. Group-Wise Distribution of the Respondents for Two Rounds of the Delphi Survey

Distribution of Respondents	China	European	American Countries
3 Months	12(11)	10(9)	7(6)
6 Months	10(10)	5(4)	6(5)
1 Year	10(9)	10(9)	6(5)
2 Years	13(13)	10(9)	6(5)
Total (105 for the first and 95 for the second round)	45(43)	35(31)	25(21)

Note: Digits in brackets "()" show the respondents of the second round in the Delphi survey.

RESULTS

Analysis

This study denotes two different forms of analysis. (i) Qualitative analysis, including the establishment of nodes, themes and factors, and the inter-correlation of the vocational institutions; and (ii) Quantitative analysis, including the normality and reliability of the data, ranking and prioritization of the vocational education factors based on mean scoring.

Qualitative Method

Table 3 lists the 14 nodes and their distribution throughout the several departments of vocational institutions.

Table 3. Vocational Education Nodes (Semi-Factors)

Vocational Education Nodes	Vocational Institutions							
	1	2	3	4	5	6	7	8
Social and economic development								
Pace of development								
The necessary level of language proficiency								
Quality of their talent development								
Efforts required to incorporate technology into education								
Motivations encouraging employees								
Support industrial development								
Diversified under the market economy								
Employment-oriented								
Short-term training programs								
Notable variation in the quality								
To create engaging and interactive learning experiences								
Information technology as a tool for the dissemination of knowledge								
To create learning experiences								

The interviewees of vocational institutions 1, 5, and 7 have a goal for social and economic development in institutions. People's needs have changed as a result of increased diversity brought about by societal progress and

the market economy. The interviewees from Universities 3 and 6 discussed the pace of development. The interviewees from institutions 2, 4, and 8 noticed that there is a necessary level of skills and education in vocational institutions. The institutions' interviewees (2, 3, 5 and 7) discussed the quality of their talent development. The effort required to incorporate technology into education was discussed by the interviewees (1, 4 and 6) that there are many efforts required for technology usage in education. There is a lot of support for motivations encouraging employees for future implementation discussed by the interviewee of institutions 1, 3, 5 and 8. Support industrial development was noticed by the interviewee of institutions 4, 6 and 7. Interviewees 2, 4, 6, and 7 revealed the need to diversify under the market economy during the interview with students from different cultures with the help of institutional facilities. Interviewees (1, 4 and 6) revealed that vocational institutions are employment-oriented institutions. Short-term training programs can be used to foster an understanding of the diversity concept discussed by interviewees 1, 3, 5 and 8. Interviewees 1, 5 and 7 discussed about facilitating notable variations in the quality of skilled education. To create engaging and interactive learning experiences through technology usage and communication between students discussed by 2, 4 and 8 (Means, 2010). The interviewees from universities 2, 3, 5 and 7 mentioned information technology as a tool for the dissemination of knowledge. Creating learning experiences through different languages was also identified by the interviewees of universities 1, 5 and 7.

Development of a Cross-Cultural Studies Framework for Narrative Studies

Six themes (Vocational education nodes) were developed from these significant nodes (semi-factors), which were the most prevalent in all eight interviews. They were created once nodes were discovered. The following are these six key themes or factors:

Social and economic development;

Motivations encouraging employees;

Short-term training programs;

Support industrial development;

Information technology as a tool for the dissemination of knowledge;

To create learning experiences.

Developing a framework is the last step in the qualitative approach to data interpretation. **Figure 2** represents the factors and their relationship.

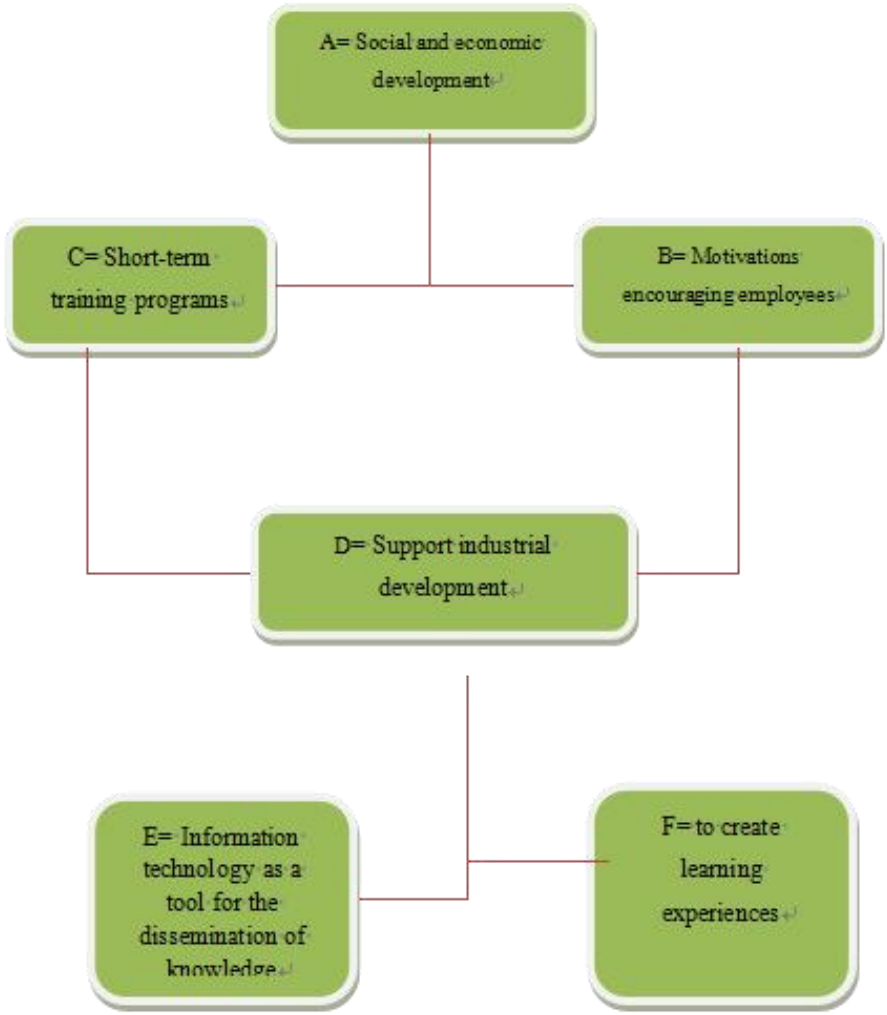

Figure 2. The Developed Framework of Vocational Institutions Factors

Quantitative Method

Normality & Reliability Test

The smart PLS (SEM) and Microsoft Excel were used to collect and analyse the data. The Shapiro-Wilk normality test was used to determine whether the data were normally distributed or not. The results show that less than 0.05 ($p<0.05$) was the significant value that was found for both rounds of the Delphi survey of all the components. In this case, more research necessitates the non-parametric test.

Table 4. The First Round of the Delphi Survey

Factors	All Groups		China		Europe		America	
	M	R	M	R	M	R	M	R
A	2.700	5	2.555	8	2.450	8	3.095	3
B	2.930	3	3.100	1	2.550	6	3.140	1
C	2.613	7	2.735	5	2.480	7	2.625	6
D	2.610	8	2.605	6	2.600	4	2.625	6
E	2.772	4	2.950	2	2.750	3	2.615	8
F	2.685	6	2.760	4	2.595	5	2.700	5
Samples	105		45		35		25	
Cronbach Alpha	0.804		0.771		0.762		0.769	

Note: M = Mean; R = Rank.

Present consensus between China and Europe.
Present consensus between China and America.
Present consensus between China and America.
Present consensus between Europe and America.

Table 5. Second Round of Delphi Survey

Factors	All Groups		China		Europe		America	
	M	R	M	R	M	R	M	R
A	2.600	8	2.550	7	2.620	7	2.630	8
B	2.752	5	2.775	5	2.520	8	2.960	5
C	2.865	4	2.805	4	2.690	5	3.100	2
D	3.003	1	2.855	3	3.120	1	3.035	3
E	2.895	2	2.740	6	2.805	3	3.140	1
F	2.882	3	2.900	1	2.725	4	3.020	4
Samples	95		43		31		21	
Cronbach Alpha	0.806		0.762		0.702		0.756	

Note: M = Mean; R = Rank.
Present consensus between China and Europe.
Present consensus between China and America.
Present consensus between China and America.
Present consensus between Europe and America.

Ranking Based on the Mean Score

Additionally, groups of respondents were asked to list and rank the cross-vocational education factors on a scale of 1 to 5, with 1 denoting strong agreement and 5 denoting strong disagreement. Based on their mean, the vocational education variables were calculated and arranged from strongly agree to strongly disagree. Based on the mean ratings for all respondents and each respondent group, six criteria in total were rated (**Tables 4** and **5**). **Table 4** displays the order of the components of the vocational education variables in the first round. The respondents chose the factor Social and economic development mean (2.943), which was placed first based on their mean, as something they strongly agreed with. Similar to this, motivating employees was chosen as important (mean 2.700) based on their significance. According to the respondents' mean (2.930), the factor optimization for short-term training programs was evaluated as being important (first). The elements promoting industrial growth are ranked seventh on average (2.613). With a mean score of 2.685, respondents put information technology as a medium for knowledge transmission in second place in the second round of the Delphi survey. Information technology's role as a medium for knowledge transmission placed fourth in the first round of the survey (mean 2.752) and third in the second round (mean 2.895). Similar to this, according to their unified significance level, the respondents ranked the "factor" to create learning experiences sixth (mean 2.882) and thought it was extremely important.

Based on their mean score, **Table 6** displays the second round of the Delphi survey, all of the vocational education criteria were ranked. The findings also indicate that the factors' significance level has increased as indicated by their mean score changing from "agree" to "neutral".Other factors have a significance level based on the mean score as “Social and economic development”(significance as neutral) in both rounds, motivations encouraging employees (significance as neutral) in the first-round round and (significance as agree) in the second round, optimization for short-term training programs, support industrial development, information technology as a tool for the dissemination of knowledge, and to create learning experiences significance as neutral) in both rounds of the Delphi survey. No factor had a grade of less than 2.5 in this survey, and each factor had a sizable amount of neutral or agrees. It can be claimed that all of the aforementioned elements will have a significant impact on how the school-enterprise model evolves in the future from the perspective of vocational education.

Table 6. The Significance Level of Vocational Education Factors

1st Round				2nd Round			
Factors	M	R	S	Factors	M	R	S
A	2.943	1	Neutral	A	2.600	8	Neutral
B	2.700	5	Neutral	B	2.752	5	Agree
C	2.930	3	Neutral	C	2.865	4	Neutral

1st Round				2nd Round			
D	2.613	7	Neutral	D	3.003	1	Neutral
E	2.610	8	Neutral	E	2.895	2	Neutral
F	2.685	6	Neutral	F	2.882	3	Neutral

Note: M = Mean; R = Rank; S = Significance and agree shows more significance from the first round to the second round.

DISCUSSION

The study has found that the vocational education components that have the greatest impact on the development of skilled employees and the workforce are those that are supported by educational facilities and performance evaluation. Semi-structured interviews and a Delphi survey were both a part of the school-enterprise model study that used a mixed-method approach. The targeted group (vocational education institution faculty) was surveyed to get qualitative data using semi-structured interviews that incorporated the narrative technique. The qualitative analysis produced a total of 14 nodes, which were then prioritized according to their importance using a two-round Delphi survey (quantitative approach) of the targeted demographic (China, Europe and America). The qualitative data were eliminated and subjected to statistical analysis with the assistance of statistical tools, which led to the extraction of all six components of vocational education. The Delphi survey (quantitative analysis) was carried out to see whether Chinese, European and American respondents agreed.

Federal financing has historically played a significant role in workforce development interventions, with much of it going towards short-term training programs (less than six months) and very little interaction or collaboration between colleges (Fox, 2015; Luo, Guo, & Li, 2021). A parallel body of study examines how employees move between areas. Ever since Alfred Marshall it has been argued that workers moving between firms is a mechanism for labor-market pooling, localized spillovers and knowledge externalities (Bruni, Luch & Kuoch, 2013). The skill composition of these moves has been considered in more recent studies. Spillover effects have been associated with competent employees' and researchers'/inventors' movement in particular (Fratesi, 2014; Han, 2014). Only the wage difference between college graduates and vocational high school graduates was proven (Choi, 2021). It's important for both employees and employers that one feels content with their professional situation: High vocational satisfaction is linked to greater work engagement and superior job performance, while low vocational satisfaction is linked to turnover intentions, workplace deviant behavior, and poorer physical health (Zabeli & Gjelaj, 2020). This study's idea of vocational satisfaction, which is defined as satisfaction with one's job and profession, reflects a component of work-related well-being (Abdel Hadi, Kersting, Klehe, Deckenbach, & Häusser, 2023). The discussion over the economy has also helped to increase political awareness of the significance of education, particularly vocational education. Vocational training is, in fact, a necessary component of a successful digital economy (Cattaneo, Antonietti, & Rauseo, 2022). In China, Europe, and America, the importance of vocational education has grown in supporting workforce development, providing skilled labor, and teacher preparation.

CONCLUSION

This study also emphasizes how crucial teacher preparation is to guarantee the standard of vocational education. The effectiveness of school-business collaboration models and the creation of skilled workers both heavily depend on the caliber of instruction provided in vocational schools. Another important objective of vocational education and training, in both China and Western nations, is workforce development. This study offers a thorough overview of school-business cooperation approaches used in China, as well as in Europe and the United States, for vocational education. The finest techniques and approaches are highlighted for boosting school-business collaboration, creating skilled workers, enhancing teacher preparation, and attaining workforce development objectives. For policymakers and stakeholders in vocational education and training who want to increase the efficacy of school-enterprise collaboration models in their regions, the study's findings have significant ramifications. The comparative examination of school-enterprise collaboration models of vocational education in China, Europe, and America with skilled employees, teacher training, and workforce development has some drawbacks. The study largely relies on the case studies and the review of the literature. The case studies have limits such as their sample size, representativeness, and general ability, but the literature evaluation offers a comprehensive comprehension of the subject. This study may not offer a thorough understanding of school-enterprise cooperation approaches in other locations because it exclusively focuses on the chosen nations. The

Delphi technique utilized in this study also involves a group of experts coming to a consensus. Although this method can offer insightful information, it might not always represent the opinions and experiences of other parties involved in vocational education and training, such as students and employers. Despite these drawbacks, this study highlights the best practices and strategies for improving vocational education and training and offers a useful framework for understanding the school-enterprise cooperation models of vocational education in various regions.

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