

Quality Education via a Talent Cultivation Mode of School-Enterprise Cooperation Based on the Collegial Management Theory

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Abstract

With the development of science and technology, integrating academia with industry has become increasingly important and school-enterprise cooperation is on the rise. However, the talent cultivation mode of school-enterprise cooperation is at its infancy. There are still many problems of the school, enterprise and government in school-enterprise cooperation. This research explores the talent cultivation mode of school-enterprise cooperation in China. School practical teaching, enterprise input and government involvement are the three main factors rarely studied. This research adopted a quantitative research method, and questionnaires were distributed to students, teachers, enterprise employees, and government officers in Xingtai City, Hebei Province, China. The respondents were from six schools, eight enterprises, and three government departments, and 598 questionnaires were collected. Research findings reveal that school practical teaching, enterprise input, and government involvement have a positive effect on the talent cultivation mode. However, based on Bush's (2020) collegial management theory, strengthening the three factors can improve the talent cultivation mode and provide quality education, a more sustainable access to knowledge and educational resources and good governance.

Keywords: *quality education, talent cultivation mode, school-enterprise cooperation, collegial management.*

1. Introduction

In recent times, the objective of talent cultivation in China is to cultivate certain professional skills or professional qualities that meet the requirements of enterprises. Yang (2018) claims that the school-enterprise partnership in higher vocational education is a synergistic structure created by schools and businesses to coordinate and promote good high-quality skilled technical abilities. According to Ma (2020), collaboration between higher institutions of vocational education and business enterprises is a major factor in how employable vocational education is. The university plays a significant role in teaching and has an impact on the development of the region through the interaction with industry (Dragusha, Prenaj, and Miftari, 2022). The aim is to provide quality education and to create a more sustainable access to not only knowledge and educational resources but also good governance. Target 4.1 of SDG 4 from 2015, which asks for

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inclusive and equitable quality education for all people, is echoed by this (United Nations [UN], Target 4.1).

Academic research emphasizes the importance of the school-business partnership's talent cultivation strategy, however Chen and Li (2021) contend that there is no one highly effective talent training strategy for higher vocational education. Bian and Wang (2021) are adamant that encouraging school-business collaboration will increase the competitiveness of small and medium-sized businesses and assist numerous schools and universities in providing entrepreneurship education. In-depth school-enterprise cooperation, according to Hu, Tan, and Gao (2022), can support the transformation of higher vocational colleges' school-running concept and talent training mode, deepen the teaching reform of higher vocational colleges, and increase the employment rate of higher vocational colleges. Tan et al.'s (2022) study looked at the direct impact of learner, learning environment, and content quality on students' employability. The results show that the learning environment and material quality have a greater impact on students' employability than learner quality. From the industry, a study by Wang et al. (2021) examined the connection between self-efficacy, transformational leadership and Malaysian employees of international commercial banks. The findings indicate that self-efficacy has a moderating role in the relationship between transformational leadership and employees.

Globally, talent cultivation mode has been studied, including mentoring in Russia, collaboration activities across Finland, United Kingdom, and South Africa, technoparks in Turkey, dual system in German, Switzerland and Denmark, and CBE in the U.S (Osipova et al., 2019; Ezeuduji et al., 2022; BÖYÜKASLAN and ÖZKARA, 2022). In China, there are mainly "order-based" training methods. Puerta-Sierra and Jasso (2020) stated that besides research and teaching, universities have a third role providing new knowledge for industrial purposes. Kowang et al.'s (2020) study assessed the level of Industry 4.0 competencies among lecturers in Malaysia in the areas of Organizational Learning, Continuous Improvement, Information and Communication Technologies, Environment, and Innovative Management. The findings revealed the need to improve Industry 4.0 competencies among lecturers across all five competencies.

Although learning ability and adaptive ability were cultivated, professional skills were still lacking (Cheng et al., 2019). Zhang (2022) noted that the lack of incentive for industry-university-research collaboration and the persistence of the occurrence of this gap are both problems.

2. Research Objectives

Through adopting collegial management theory, the researcher intends:

- (1) To explore the role of school practical teaching in talent cultivation mode of school-enterprise cooperation;
- (2) To investigate the role of enterprise input in talent cultivation mode of school-enterprise cooperation;
- (3) To discover the role of government involvement in talent cultivation mode of school-enterprise cooperation.

3. Literature Review

School-enterprise cooperation, as indicated by Dragusha, Prenaj, and Miftari (2022), refers to collaboration between educational institutions and businesses. To combine theoretical knowledge with practical projects, improve the school-enterprise talent co-construction training base, and implement the "embedded" talent training model, schools

and businesses jointly set curriculum content, practical training requirements, and skill evaluation standards (Wang, 2020). According to Arranz et al. (2022), fostering a close, comprehensive partnership between the institution and the business facilitates the hiring of graduates.

Bonoli and Wilson (2019) analyzed the dual apprenticeship systems' inclusiveness in Germany, Switzerland and Denmark, expecting to enhance it by governments with minimal disruption to the entire system. However, inclusiveness may lower the quality of the talents. Long, Bernoteit, and Davidson (2020) discussed a competency-based education (CBE) in the U.S, which is focused on actual student learning rather than time spent in class or focused on material. But, competency-based education requires careful planning and execution which can be quite a challenging and impossible task. China's skill-based talent training model has not yet formed a relatively complete model. At present, there is "order-based" training method, the school-run factory or enterprise-run school method, and the "work-study alternation" method (Zhu, 2020).

Talent cultivation mode of school-enterprise cooperation have been broadly studied domestically and overseas. However, in the early stage of the study on talent cultivation mode of school-enterprise cooperation, they mainly focused on the cooperation form. Nguyen et al. (2019) emphasized that putting practical activity into teaching is extremely necessary and consistent with the requirements of developing quality education, thus students know how to apply knowledge from classroom lessons into practice. This is as per the goal of SDG 4 is to ensure inclusive and equitable quality education for all (United Nations [UN], 2015, Target 4.1. Nevertheless, the lack of weak practical links in engineering education have not been solved for a long time (Zhang, 2022). Enterprises can provide resources such as capital, market expansion channels and technology research and development capabilities. However, enterprises often fail to devote their energy and time during internships and refuse to cooperate with the concept of school-enterprise cooperative teaching (Ling, Hu and Wang, 2021). More research and understanding of the execution and management of these university-industry-government collaboration activities is needed (Rantala, Ukko and Saunila, 2021).

To remove barriers preventing the growth of school-enterprise cooperation in higher vocational institutions, the researcher used Tony Bush's collegial management theory which has the following characteristics : (1) goals are set at the institutional level; (2) the process by which goals are set is agreed upon by the leader and teachers; (3) decisions are based on agreed goals; (4) there is an objective reality lateral; (5) shared decision making blurs accountability; and (6) it is associated with participative leadership (Xhomara, 2019).

4. Methodology

4.1 Research method

This research used the quantitative method approach to collect primary data by gathering observations of the respondents without intervention. The study was conducted under non-contrived settings.

4.2 Research design

According to multiple parties' involvement from the collegial management theory, the variables for this research include school practical teaching, enterprise input, and government involvement. The stakeholders are students, teachers, enterprise officers, and government officers. Four sets of questionnaires were designed, and the content of these items was different. 14 items in the questionnaire were related to school practical teaching, 11 items in the questionnaire were related to enterprise input, and 9 items in the questionnaire were related to government involvement. In this study, the population

consisted of teachers, students, employees and government officers studying and working in Xingtai City, Hebei Province, China. The population is from six schools, eight enterprises, and three government departments. 293 students, 133 teachers, 132 employees and 40 education administration officers were investigated as participants, and a total of 598 questionnaires were collected. The questionnaires were distributed through Questionnaire Star, which was an online statistical tool and SPSS 25.0 software was the main tool used to analyze the data.

5. Results

5.1 Demographic analysis

Table 1 Characteristics of the study sample

Respondent	Institution	Size
Student	Hebei Institute of Mechanical and Electrical Technology, Xingtai Technician College, Hebei Vocational University of Technology and Engineering, Xingtai Modern Vocational School, Xingtai Xindu District Vocational Education Center, College of Mechanical and Electrical Engineering of Xingtai University	293
Teacher		133
Enterprise employee	Gree (Wu 'an) Precision Equipment Manufacturing Co., LTD Xingtai Chunlei New Energy Development Co. LTD Julu County Hongwei Sealing Electrical Parts Co., LTD Xingtai Chaoyang Machinery Manufacturing Co. LTD Hebei Chuangli Electromechanical Technology Co., LTD Xingtai Nakonor Finishing Mill Technology Co., LTD Tronics Intelligent Technology (Jiangsu) Co., LTD Hebei Sanxia Kitchenware Co., LTD	132
Government officer	Hebei Province Education Department Xingtai Education Bureau Xindu District Education Bureau	40

Table 1 above describes the organization distribution of students, teachers, enterprise employees and government administration officers for this research. 293 students and 133 teachers from six schools, 132 employees from eight enterprises, and 40 government officers were investigated. The diversity of samples ensures the diversity of data.

5.2 Factor analysis

Table 2 Factor analysis

Questionnaire	KMO	Bartlett	No of common factors	No of related questions
Student	0.852	<0.001	2	9
Teacher	0.801	<0.001	2	7
Enterprise	0.547	<0.001	4	6
Government	0.545	0.006	3	8

From Table 2, KMO value is above 0.5, hence it is suitable to do the factor analysis. Besides, the significance level of Bartlett's test value is less than 0.05, which rejects the null hypothesis and believes that the variables are highly correlated.

5.3 Descriptive analysis

5.3.1 RQ1: What is the role of school practical teaching in talent cultivation mode of school-enterprise cooperation?

Table 3.1 Survey on learning experience in enterprises

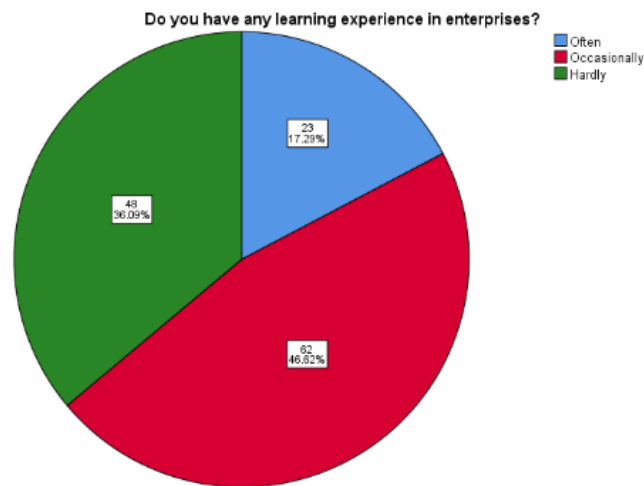
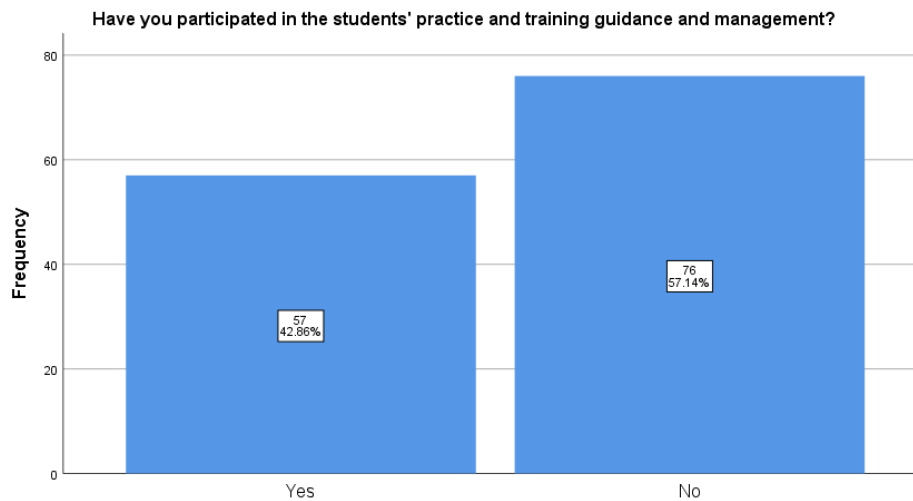


Table 3.2 Survey on participation in the students' practice and training guidance and management



In Table 3.1, as can be seen that 36.09% teachers hardly have had the opportunity to gain some learning experience in enterprises, 46.62% teachers occasionally have had the opportunity, while 17.29% teachers stated they often had the opportunity. often. While in Table 3.2, 42.86% teachers have participated in the students' practice and training guidance and management, while a startling 57.14% teachers have not participated in the students' practice and training guidance and management.

5.3.2 RQ2: What is the role of enterprise input in talent cultivation mode of school-enterprise cooperation?

Table 4.1 Survey on frequency of business mentors going to school to give guidance

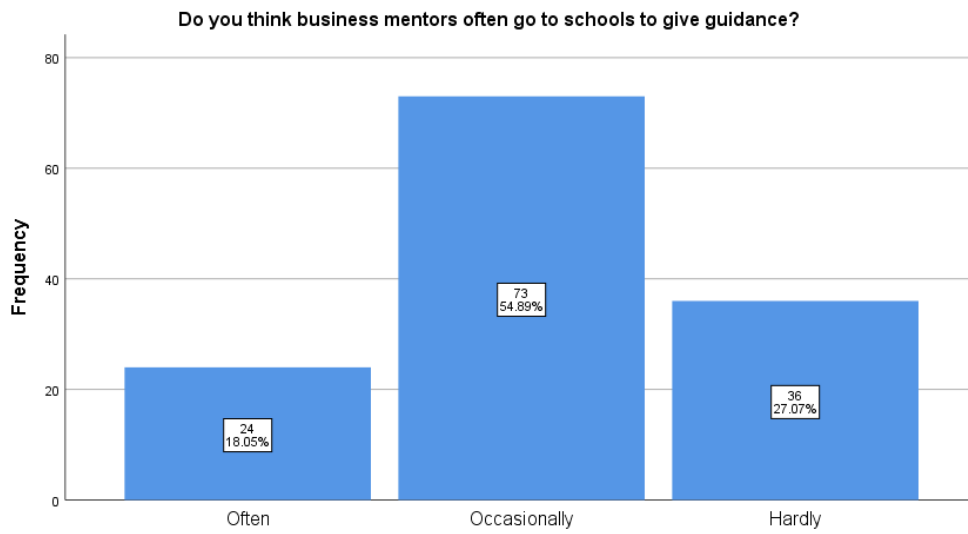
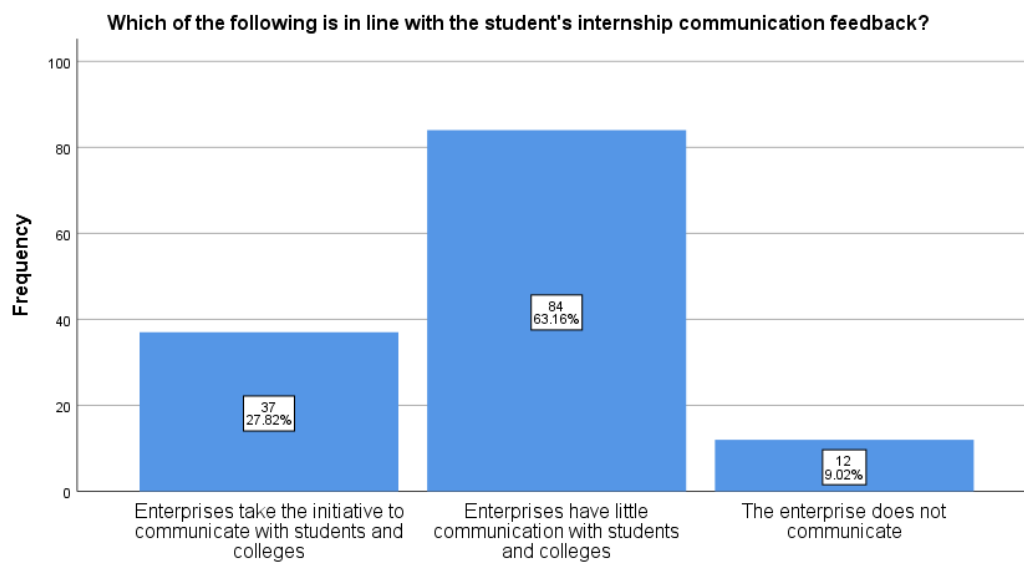


Table 4.2 Survey on student’s internship communication feedback



In Table 4.1, 18.05% respondents believed that enterprise mentors often go to schools for guidance, while 81.95% respondents believed that enterprise mentors rarely go to schools for guidance or even none. In Table 4.2, 27.82% of enterprises can take the initiative to communicate and give feedback to students' colleges and universities, but again a startling 72.18% of enterprises seldom or never take the initiative to communicate and give feedback to students and colleges and universities.

5.3.3 RQ3: What is the role of government involvement in talent cultivation mode of school-enterprise cooperation?

Table 5.1 Survey on interconnected school-enterprise cooperation information platform

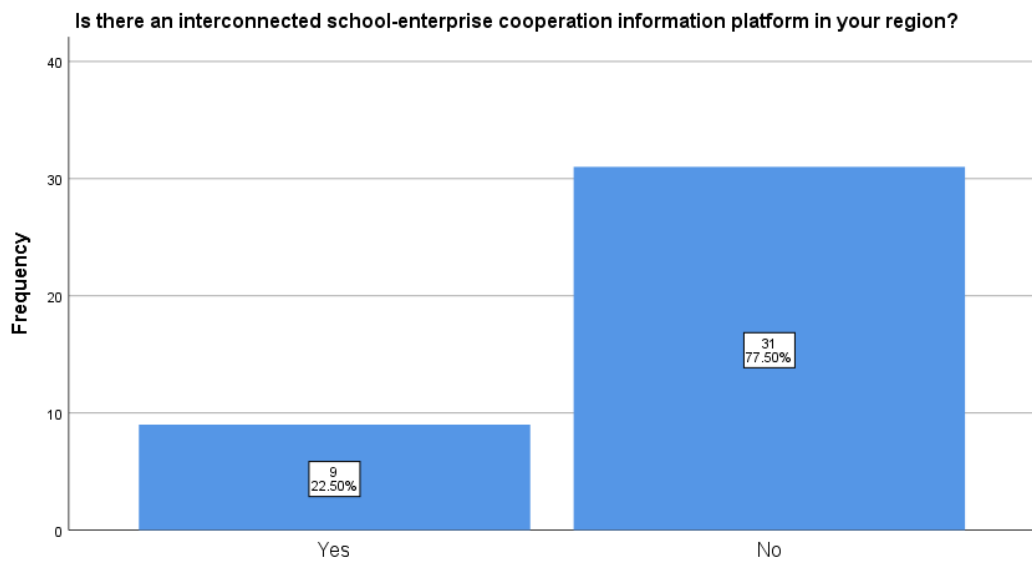
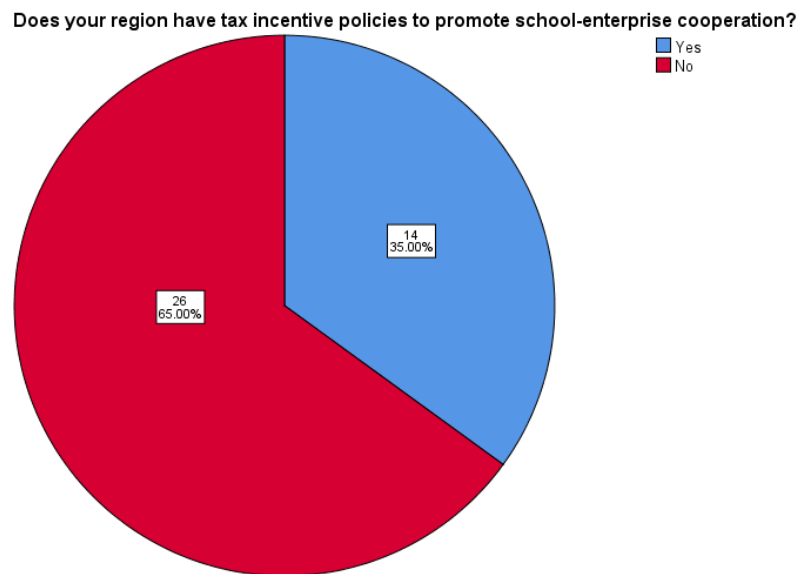


Table 5.2 Survey on tax incentive policies to promote school-enterprise cooperation



In Table 5.1, 9 respondents said there was interconnected school-enterprise cooperation information platform, accounting for 22.5%, while 31 respondents said there was not, accounting for 77.5%. In Table 5.2, 14 respondents said that they have formulated tax incentive policies to encourage school-enterprise cooperation, accounting for 35%, but 26 respondents said that they have not formulated tax incentive policies to encourage school-enterprise cooperation, accounting for 65%.

5.4 Spearman correlation analysis

Table 6 Hypothesis analysis

No	Research Objectives	Research Objectives	Hypothesis	r_s	P-value	Decision
1	R01	To explore the role of school practical teaching in talent cultivation mode of school-enterprise cooperation.	H_1	0.512	<0.001	Accepted
2	R02	To investigate the role of enterprise input in talent cultivation mode of school-enterprise cooperation.	H_2	0.682	<0.001	Accepted
3	R03	To discover the role of government involvement in talent cultivation mode of school-enterprise cooperation.	H_3	0.423	0.007	Accepted

It can be seen from Table 6 that the p-value of the three research objectives is all less than 0.05, hence the three hypotheses are accepted. Through data analysis, we can see that the role of school practical teaching on talent cultivation mode of school-enterprise cooperation is positive, the role of enterprise input on talent cultivation mode of school-enterprise cooperation is positive, and the role of government involvement on talent cultivation mode of school-enterprise cooperation is positive.

6. Discussion

The teachers' practical teaching ability in the area of school enterprise cooperation is still lacking, on the other hand, the practical teaching activities for the students are insufficient. The role of school practical teaching is not fully played out. This can support that schools' fundamental contribution to society in creating and passing on useful knowledge and engaging with society for its application (Terán-Bustamante, Martínez-Velasco and López-Fernández, 2021).

Moreover, the enterprise mentors' participation in school guidance is low. Most enterprises are not active in communicating feedback with the students and colleges. The role of enterprise input is also not fully played out. These findings can support the previous literature that several barriers exist between academia and industry, often resulting in firms' unfavorable perception of academics and their proposed services and a low demand for university knowledge (Nsanzumuhire et al., 2022). According to Rasli et al., (2022), institutions must develop action plans for integrating sustainability across their value chain in order to ensure long-term value creation and to give students the skills and knowledge required to apply design, innovation, and leadership competencies inside the university ecosystem.

Furthermore, the interconnected school-enterprise information platform is still insufficient. The government does not have enough tax incentives in school-enterprise cooperation. The role of government involvement is also not fully played out. The current findings can support the statement that government's diversified policy measures are relevant at school-enterprise cooperation's different development levels (Kopczynska and Ferreira, 2021).

Based on literature, the talent cultivation mode is not mature enough, and the elements of school practical teaching, enterprise participation and government platform and evaluation are lacking. This research filled the gap of the collegial management theory. The roles of school practical teaching, enterprise input and government involvement are not fully played out. Through improving their roles, the mode can be mature.

From the findings, the hypotheses that the school practical teaching, enterprise input and government involvement have a positive effect on the mode proves to be accepted. As a result, schools should cultivate “double-qualified” teachers, enterprises should participate in the whole process of talent cultivation, and government should provide all-round support. Thus, students’ practical ability can be strengthened, participation of the enterprise can be improved, and strong supervision and constraints can be formed.

7. Conclusion

The study has shown that there is straight and high correlation between school practical teaching, enterprise input, government involvement and talent cultivation mode of school-enterprise cooperation. However, many problems exist, such as insufficient participation of schools, enterprises and the government in talent cultivation process. As per the emphasis of Bush’s(2020) Collegial management theory, power and decision-making should be shared among members of the organization to inspire cooperation and meet the needs of each side.

8. Future Research

The current research is conducted in six schools and eight enterprises within the scope of Xingtai City. Due to regional development reasons, there are still some limitations in the scope of schools, enterprises and government departments at all levels under investigation. Given the fact that school-enterprise cooperation is becoming more and more complicated, stakeholders such as trade associations, Vocational Education Group could be included to increase diversity. Future research can make use of extra tools of data collection such as qualitative method, to bring more insights to this field.

References

- Arranz, N., Arroyabe, M. F., Sena, V., Arranz, C. F., & Fernandez de Arroyabe, J. C. (2022). University-enterprise cooperation for the employability of higher education graduates: a social capital approach. *Studies in Higher Education*, 47(5), 990-999.
- Bian, F., & Wang, X. (2021). School enterprise cooperation mechanism based on improved decision tree algorithm. *Journal of Intelligent & Fuzzy Systems*, 40(4), 5995-6005.
- Bonoli, G., & Wilson, A. (2019). Bringing firms on board. Inclusiveness of the dual apprenticeship systems in Germany, Switzerland and Denmark. *International Journal of Social Welfare*, 28(4), 369-379.
- Böyükaslan, H. D., & Özkara, B. (2022). The Emergence of Technoparks as a New Organizational Form: A Study from the Perspective of Coevolution. *Ege Academic Review*, 22(4), 425-444.
- Bush, T. (2020). Theories of educational leadership and management. *Theories of Educational Leadership and Management*, 1-208.
- Chen, D., & Li, F. (2021). Teaching practice of architectural decoration engineering technology specialty in higher vocational colleges based on the school-enterprise cooperation education model based on fuzzy algorithm. *Journal of Intelligent & Fuzzy Systems*, (Preprint), 1-11.
- Dragusha, B., Prenaj, V., & Miftari, I. (2022). <https://ejce.cherkasgu.press>. *European Journal of Contemporary Education*, 11(2).

- Ezeuduji, I. O., Nzama, A. T., Nkosi, G. S., Kheswa, T. P., & Shokane, A. L. (2022). Stakeholder perceptions of university-industry collaboration on tourism and business students' employability in two continents. *Journal of Teaching in Travel & Tourism*, 1-24.
- Hu, X., Tan, A., & Gao, Y. (2022). The Construction of the Development Mode of School-Enterprise Cooperation in Higher Vocational Education with the Aid of Sensitive Neural Network. *Wireless Communications and Mobile Computing*, 2022.
- Kowang, T. O., Bakry, M. F., Hee, O. C., Fei, G. C., Yew, L. K., Saadon, M. S. I., & Long, C. S. (2020). Industry 4.0 competencies among lecturers of higher learning institution in Malaysia. *International Journal of Evaluation and Research in Education (IJERE)*, 9(2), 303-310. DOI: 10.11591/ijere.v9i2.20520
- Kopczynska, E., & Ferreira, J. J. (2021). The Role of Government Measures in University-Industry Collaboration for Economic Growth: A Comparative Study across Levels of Economic Development. *Triple Helix*, 8(3), 486-533.
- Ling, Y., Hu, B., & Wang, L. (2021). RETRACTED: Rethinking and reflecting on cooperation between schools and enterprises: Research into the concept of school enterprise cooperation.
- Long, C., Bernoteit, S., & Davidson, S. (2020). Competency-Based Education: A clear, equitable path forward for today's learners. *Change: The Magazine of Higher Learning*, 52(6), 30-37.
- Chunying, M. (2020). Mediating role of Psychological Capital in relationships between school-enterprise cooperation and employment of students' higher vocational education institutions. *Revista de Psicología del Deporte (Journal of Sport Psychology)*, 29(4), 135-148.
- Hau, N. H., Tuan, B. A., Thao, T. T. T., & Wong, W. K. (2019). Teaching Mathematics by practical decision modeling in Vietnam high schools to serve the fourth industrial revolution. *Journal of Management Information & Decision Sciences*, 22(4).
- Nsanzumuhire, S. U., Groot, W., Cabus, S. J., Ngoma, M. P., & Masengesho, J. (2023). Assessment of industry's perception of effective mechanisms to stimulate academia-industry collaboration in Sub-Saharan Africa. *Industry and Higher Education*, 37(3), 409-432.
- Осипова, С. И., Кузьмина, Н. А., Гафурова, Н. В., & Осипов, В. В. (2019). Mentoring as a form of assistance to a transport university student in the "University-Enterprise" networking cooperation.
- Puerta-Sierra, L., & Jasso, J. (2020). University-industry collaboration. an exploration of an entrepreneurial university in Mexico. *Journal of technology management & innovation*, 15(3), 33-39.
- Rasli, A., Tee, M., Lai, Y. L., Tiu, Z. C., & Soon, E. H. (2022). Post-COVID-19 strategies for higher education institutions in dealing with unknown and uncertainties. *Frontiers in Education*, 7. <https://doi.org/10.3389/educ.2022.992063>
- Tan, Kowang & Lim, Kim & Yen, How & Hee, Ong & Fei, Goh & Rasli, Amran & Sang Long, Choi. (2022). Relationship between teaching quality factors and employability among Technology Management students. *International Journal of Evaluation and Research in Education (IJERE)*. 11. 1154. 10.11591/ijere.v11i3.21836
- Terán-Bustamante, A., Martínez-Velasco, A., & López-Fernández, A. M. (2021). University-industry collaboration: a sustainable technology transfer model. *Administrative Sciences*, 11(4), 142.
- United Nations (2015). *Transforming our world: The 2030 agenda for sustainable development*. New York: United Nations, Department of Economic and Social Affairs.
- Wang, B. (2020). Research on the Training Model of Applied Art Professionals in Local Universities. *Open Journal of Social Sciences*, 8(11), 149-158.
- Wang, Y., Lin, J., Osman, Z., Farooq, M., & Raju, V. (2021). Transformational Leadership and Employee Performance in International Commercial Banking Industry in Malaysia: The Role of Self-efficacy As a Mediator under BRI. *Journal of Chinese Human Resources Management*, 25-36.

- Xhomara, N. (2019). The effect of collegial school management on improvement of students' skills. *Pedagogika*, 136(4), 153-171.
- Yang, S. (2018). Mechanism of deepening the cooperation between schools and enterprises in higher vocational education. *Educational Sciences: Theory & Practice*, 18(6).
- Zhang, L. (2022). The application of adaptive analytic hierarchy process driven by multisource big data in the training of school-enterprise joint engineering ability. *Scientific Programming*, 2022, 1-14.
- Zhu, J. (2021, January). Research and practice on the talent training model of school-enterprise cooperation for music performance major in university. In *2020 3rd International Seminar on Education Research and Social Science (ISERSS 2020)* (pp. 511-515). Atlantis Press.