Research Article

Evaluation on the Training Effect of Applied Talents in Higher Vocational Colleges under the Background of Regional Economy

Xin Yang

Department of Foreign Language and Tourism, Henan Institute of Economics and Trade, Zhengzhou 450000, China

Correspondence should be addressed to Xin Yang; yangxin@henetc.edu.cn

Received 7 May 2022; Revised 11 June 2022; Accepted 13 June 2022; Published 12 July 2022

Academic Editor: Wen-Tsao Pan

Copyright © 2022 Xin Yang. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

The purpose of higher vocational (HV) colleges is to serve regional economic development. Regional economy and HV education are mutually reinforcing and complementary. Based on the consideration of regional economic needs, this paper first divides the indexes of applied talents training effect in higher vocational colleges into four categories, namely, teaching level, employment results, employment ability, and satisfaction and establishes the index system. Then, we introduce the analytic hierarchy process (AHP) to calculate the weight and take A college as an example to evaluate and analyze the training effect of applied talents. Finally, according to the existing problems of HV education in serving regional economic development, we put forward the development suggestions of applied talents training mode in HV colleges, so as to provide some reference for HV colleges to improve their education level.

1. Introduction

Regional economy refers to the national economic value generated by the administrative region. The economic value of the region in the process of development will be affected by political factors and geographical environmental factors so that its economic value presents certain differences [1]. We can analyze regional economy from both macro and microperspectives. From the macroperspective, the regional economy can be seen as a microcosm of the economic development of the whole country, which has certain comprehensive and regional characteristics [2]. From the microperspective, the important factor affecting the national economic development is the supply of social talents [3]. Therefore, through the combination of professional talents and regional industrial development trends, the original economic system can be optimized and improved to the maximum extent, so as to ensure the sustainable use of talents is based on the premise of stable economic development. The purpose of HV education is to serve the development of the regional economic [4]. HV education trains talents for regional economic and social development. At the same time, regional social and economic development is the source of life for HV colleges. So the relationship between regional economy and HV education is mutually reinforcing and complementary. Therefore, HV institutions undertaking talent training should deeply analyze the internal relationship between talent supply and regional economic development and then combine educational technology and teaching theory to cultivate talents in all aspects [5].

However, there are many problems in serving regional economic development in HV colleges. For example, the service consciousness of HV colleges to regional enterprises is not strong, the talent training structure and the demand of regional economic development are not enough, the talent structure is single, the professional setting and the position of enterprises are deviated, and the professional quality and skill quality of talents can not meet the development needs of regional enterprises [6–9]. The causes of these problems are mainly manifested in the following aspects. First, HV colleges are not clear about their professional orientation. Because many schools do not have their own school-running characteristics and professional characteristics, or positioning did not follow the established goal of development, so as to find a meeting point in the process of regional economic development [10]. Second, the lack of hardware in
some HV colleges leads to a serious imbalance of professional structure, which is difficult to ensure the quality of education and teaching [11]. Third, the professional settings targeted are not strong. Many HV colleges have not fully taken into account the need to adapt to regional economic development in terms of specialty setting and have not really established a relationship with local industries to set up specialties [12]. Fourth, teachers cannot meet the needs of HV education. The characteristics of HV education determine that teachers must not only master professional theoretical knowledge but also have skilled practical operation ability and technical application ability. However, there is a large gap in the number of teachers with these abilities, which restricts the improvement of professional teaching level in HV colleges [13]. Fifth, the construction of training practice bases is relatively backward. The training base should reflect the real occupational environment of enterprises, but some majors in HV colleges do not construct the corresponding practice training base, or multiple majors jointly use a practice training place, which leads to students can not adapt to the actual job needs of enterprises immediately after employment [14]. In summary, HV education and regional economic development must coordinate with each other and constantly optimize the talent training mode and school-running thought. HV colleges should find a platform suitable for economic development in the future development [15]. It can not only meet the needs of regional economic development but also realize its own development and improvement, thus truly realizing the long-term development of HV education and regional economy [16].

The two major implementation subjects involved in the talent training of HV education and the talent demand of regional economic development are HV colleges, local enterprises, and governments. However, how the final implementation effect needs the final beneficiary groups to evaluate, namely, students and society. Only when they are recognized by students and society, can their docking policy be successful [17]. At present, the relationship between talent training in HV education and regional economic development has been promoted by universities and government enterprises from theoretical research to practical application. The docking effect of the two needs to be studied theoretically [18]. Therefore, it is necessary to use reasonable judgment standards and appropriate evaluation methods to evaluate the talent training of HV education and the demand of regional economic development talents. Based on this, this paper constructs the effect index system of applied talents training in HV colleges and puts forward a fuzzy comprehensive evaluation method for evaluating the effect of applied talents training by using AHP. It can provide certain standards for HV colleges to cultivate applied talents adapting to the regional economy and also provide a certain reference for HV colleges to understand their own educational level.

2. Related Work

At present, some scholars have studied the relationship between regional economy and HV. They believe that studying how colleges and universities serve the local economy is conducive to improving the teaching ability of colleges, so as to better meet the needs of social talents. There are some scholars specifically for talent evaluation, such as talent ability and development potential [19–21]. In order to predict the future development potential of talents in cities, Cao and Li [22] designed the index system from six aspects: quantity, quality, innovation ability, mobility, external environment, and age and evaluated the sustainable development potential of talents by expert consultation method and AHP. Wang et al. [23] focused on the scientific and technological talents in rural areas and established the evaluation index system of scientific and technological talents with rural characteristics. After calculating the index weight by entropy weight method, this paper proposed an advanced evaluation method, namely, the extended TODIM method based on mixed index values. This method can avoid personal preferences of experts leading to inaccurate evaluation results, so that rural areas can better understand their level of scientific and technological talents. Zhu et al. [24] focused on the research perspective of accounting applied talents. In order to evaluate their competency, the competency evaluation index system of accounting applied talents was constructed. Then, the article used the questionnaire survey method to collect, and statistical data and introduced the factor analysis method to evaluate the competency of accounting applied talents. Similarly, Zhang [25] also used mathematical methods to evaluate the comprehensive ability of accounting talents. The difference is that the author used the group fuzzy AHP and cloud model to evaluate can effectively avoid the subjective judgment of experts leading to inaccurate results, which is conducive to the objective and fair evaluation of the comprehensive ability of accounting talents.

3. Evaluation Index System of Applied Talents Training Effect in HV Colleges

3.1. Basic Principles of Index System Construction. At present, there are many evaluations on the quality of talents in HV colleges. But affected by many factors such as limited understanding and practical conditions, many colleges have more or less problems in the evaluation of the quality of personnel training, which makes the results of the evaluation of the quality of personnel training difficult to be convincing. Because the evaluation of the training effect of applied talents in HV colleges needs to consider many factors, rather than simply from a certain aspect, so there is no unified evaluation standard. Therefore, in order to construct a convincing evaluation index system for the training effect of applied talents in HV colleges, based on the previous research on the evaluation of HV talents and combined with the current situation of talent training in HV colleges, this paper finally summarizes four influencing factors, including the teaching level of the school, the employment results, and employability of graduates and the satisfaction of the community. The index system follows some basic principles, including comprehensiveness, hierarchy, and operability, so
it has the characteristics of wide coverage and strong applicability.

3.1.1. Comprehensiveness. Comprehensiveness is the basic principle for selecting and evaluating the training effect index of applied talents in HV colleges. Therefore, we should comprehensively summarize the development status of talent education in HV colleges, so as to ensure that the selected indicators are sufficiently comprehensive and can truly reflect the actual situation.

3.1.2. Hierarchy. We select the evaluation index of applied talents training effect in HV colleges according to a certain level, so that it has a certain logic. For example, we select indicators from the level of teaching and employment in HV colleges and consider many factors in employment, including individuals, enterprises, and society.

3.1.3. Operability. When selecting the evaluation index of applied talents training effect in HV colleges, it is necessary to ensure that each index factor is easy to judge and measure. Since experts want to judge the importance of each indicator, in order to avoid the unclear interpretation of the meaning of the indicator resulting in differences in understanding and inaccurate evaluation, we will listen to the suggestions of professionals to modify the indicator to ensure that the evaluation results obtained by expert scoring are more referential when summarizing the meaning of the indicator with concise words.

3.2. Construction of Evaluation Index System of Applied Talents Training Effect in HV Colleges. When constructing the talent evaluation system of HV education, we consider the regional economic characteristics of HV education and pay attention to the regional connotation and embodiment in the evaluation, so that the evaluation of applied talents in HV education has a foothold. This paper refers to the relevant documents and the research results of relevant scholars, the opinions of professionals are widely sought, and finally, the evaluation index system of applied talents training in HV colleges is designed. The index system has 4 first-level indicators and 16 second-level indicators, as shown in Figure 1.

Among them, the specific explanation of employment ability indicators is as follows.

The development potential factor refers to the diversified communication ability of graduates and the overall resource utilization and scheduling ability. On the one hand, graduates should have certain leadership ability, including potential decision-making ability, change management ability, coordination ability, and project management ability. On the other hand, the development potential of graduates should also include the ability to perform tasks and work effectively with others.

Personal characteristics refer to the ability and quality of graduates themselves. On the one hand, graduates need to be proficient in basic professional knowledge and industry frontier information, and master efficient professional learning methods. On the other hand, graduates also need to have innovative consciousness and critical thinking, as well as the ability to assume social responsibility.

Personal performance factors are simply divided into self-marketing ability, self-management ability, and self-cognitive ability. Whether graduates can objectively evaluate their competitive advantage and ability in the labor force and accurately evaluate their personality and characteristics more suitable for what kind of work is very important.

External factors mainly include industry employment environment and enterprise working environment. These external factors will affect the employment results and work efficiency of graduates, so it is necessary to pay attention to the influence of external factors when evaluating the effect of applied talents training in HV colleges.

4. Evaluation of Applied Talents Training Effect in HV Colleges

4.1. Method Selection. After constructing the evaluation index system of applied talents training effect in HV colleges, we need to determine the weight. In order to ensure that the calculation results of index weight are objective, fair, and reasonable, this paper uses AHP proposed by American operational researchers. Compared with other weight calculation methods, AHP can unify qualitative and quantitative indicators in a model [26]. Its basic principle is to decompose the decision objectives according to the hierarchy after determining the decision objectives, and then the experts give the judgment matrix of the indicators and finally calculate the index weight according to the formula [27]. Because the index system of this paper has both qualitative and quantitative indicators, and the index system has a certain level, so it is suitable to use AHP to calculate the index weight.

4.2. Determination of Evaluation Index Weight of Applied Talents Training Effect in HV Colleges. In this paper, we use AHP to determine the weight for the training effect of applied talents in HV colleges.

4.2.1. Build Hierarchical Structure Model. We can construct a hierarchical structure model according to the index system of applied talents training effect in HV colleges, as shown in Figure 2.

4.2.2. Construct Judgment Matrix. This paper invited five experts to carry out the research work of applied talents training effect evaluation in HV colleges. Our invited experts include experts in the education industry, scholars in the economic field, and teachers in HV colleges. The expert group constructs a criterion layer judgment matrix and four index layer judgment matrices with their own theory and practical experience. In particular, experts compare the relative importance of the two indicators according to the 1–5 scale methods, so as to construct the judgment matrix. And the scoring criteria of 1–5 scale methods are shown in Figure 3.
Effect of training applied talents in higher vocational colleges

**Teaching level**
- The quantity and quality of teachers
- The quantity and quality of key specialties
- The quantity and quality of characteristic specialties
- The proportion of practical courses and theoretical courses

**Employment results**
- Overall employment rate
- Employment orientation
- Professional counterparts rate
- Salary level
- Development potential
- Personal characteristics
- Personal performance
- External factors

**Employment ability**
- Satisfaction of students with curriculum teaching
- Satisfaction of graduates with employment results
- Satisfaction of parents with employment results of graduates
- Satisfaction of enterprises with ability of graduates

**Satisfaction**
- Satisfaction of students with curriculum teaching
- Satisfaction of graduates with employment results
- Satisfaction of parents with employment results of graduates
- Satisfaction of enterprises with ability of graduates

**Figure 1:** Evaluation index system of applied talents training effect in HV colleges.

**Figure 2:** Hierarchical structure model.
A = \begin{bmatrix} a_{11} & a_{12} & \cdots & a_{1n} \\ a_{21} & a_{22} & \cdots & a_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ a_{n1} & a_{n2} & \cdots & a_{nn} \end{bmatrix}, \quad (1)

\[ a_{ij} = \frac{a_i}{a_j} \]

where A is the judgment matrix. \( a_i \) and \( a_j \) represent the elements in the hierarchy. \( a_{ij} \) represents the relative importance of the right.

4.2.3. Index Weight Calculation and Consistency Test. After discussing the establishment of multiple judgment matrices in the criterion layer and the indicator layer by the expert group, we also need to test whether the judgment matrix is reasonable so that the calculation results of the indicator weight are reasonable. We test the consistency of the judgment matrix according to formulas (2) and (3).

Among them, RI is the average random consistency index, which is obtained by looking up the table and the corresponding value is shown in Figure 4. Specifically, the consistency test is to analyze the calculation results of CR. If CR < 0.1, it means that the index weight calculated by the judgment matrix is reasonable and practical. If CR > 0.1, it means the experts must recorrect the judgment matrix until the consistency test is passed.

\[ CI = \frac{\lambda_{\text{max}} - n}{n - 1} \quad (2) \]

\[ CR = \frac{CI}{RI} \quad (3) \]

Here, CI is the consistency index, CR is the consistency proportion index, and RI is the average random consistency index.

Based on the actual effect of HV colleges on the cultivation and education of applied talents, this paper calculates and tests the judgment matrix for many times to obtain the weight values of the criterion layer and the index layer, as well as their corresponding consistency test results. The specific values are shown in Figure 5. It can be seen from these Figure 6 tables that all the Figure 7 judgment matrices pass the consistency test, indicating that the weight value of the evaluation index for the Figure 8 training effect of applied Figure 9 talents in HV colleges calculated by us is of practical significance and can be applied to the subsequent comprehensive evaluation.
The specific calculation process is as follows.

4.3.1. Determinate Evaluation Criteria for Different Indicators of Applied Talents Training Effect. We invite the expert group to set up an evaluation set according to the actual level of overall training and education of applied talents in HV colleges, as shown in Table 1. Next, experts first score qualitative indicators according to their own experience and then score quantitative indicators according to specific data. Finally, we can get the scores of all applied talents training effect indicators according to expert scores. The data of experts scoring for quantitative evaluation indicators mainly come from the statistical survey results of schools on graduates, such as the overall employment rate and the professional counterparts rate.

4.3.2. Comprehensive Evaluation Score of Applied Talents Training Effect in A College. First, we count the scores of experts on all indicators and calculate their averages. Then, we put the scores of all indicators into the formula (4) to calculate the weighted score. Finally, we sum the weighted scores to get the final score of the comprehensive evaluation of the effect of applied talents training in A college. The specific results are shown in Table 2.

\[
P = C_1 \times W_1 + C_2 \times W_2 + \cdots + C_{16} \times W_{16}.
\]  

(4)

Among them, \( P \) is the final score of the comprehensive evaluation of the training effect of applied talents in A college. \( C \) is the score of each index in A college. \( W \) is the comprehensive weight of each index.

4.4. Analysis on Comprehensive Evaluation Results. As can be seen from Table 2, the sum of the weights of graduates’ employment results and satisfaction is 74.8%, while the sum of the weights of colleges’ teaching level and graduates’ employment ability is only 25.2%. It shows that when evaluating the effect of applied talents training, graduates’ employment results and satisfaction are more important, and school teaching level and graduates’ employment ability are not key factors compared with the other two indicators. We rank the final weights of the secondary indexes in the order from low to high and get their total ranking weights, as shown in Figure 10. As can be seen from the figure, in the secondary indicators of applied talents training effect, the highest weight is the overall employment rate of schools, as high as 17.6%, followed by graduates’ satisfaction with employment results and salary levels, respectively, 16.6% and 11.5%. However, the influence of some factors is relatively weak, such as the proportion of practical courses and theoretical courses and the personal performance of applied talents. Their weight is 0.013, especially the external factors in the employment ability index. Its weight is only 0.007. It shows that HV colleges pay more attention to the employment rate and satisfaction of graduates in the process of cultivating applied talents, and graduates pay more attention to the salary level of future work in the learning process of HV colleges.

According to formula (4), we calculate the comprehensive score of the evaluation of the training effect of applied talents in A college, and the result is 78.17. We compare the calculation results with the standard value of Table 1 applied talents training effect evaluation and find that 78.17 points are in the general level of expert score. The score results show that the training effect of applied talents in A college is at a medium level, and it has achieved good results in training and educating some applied talents, such as the overall employment rate of graduates, the personal characteristics of graduates, and the satisfaction of graduates with the employment results. However, the number and quality of practical courses and the development potential of applied talents have not yet reached the ideal goal.

To sum up, the comprehensive evaluation process of applied talents training effect in A college is shown in Figure 11.

4.5. Suggestions on Training Mode of Applied Talents in HV Colleges

4.5.1. Set Goals for Talent Training on the Basis of the Development Trend of Regional Economy. In the process of cultivating applied talents, HV colleges mainly set training objectives to achieve the education and training system based on human resources, educational resources, and social resources. This can further improve the standardization of personnel training, so as to ensure the sustainable demand for human resources in the process of regional development. At the same time, considering the correlation between the regional economy and the higher education system, local colleges should use talents to serve the society and ensure the maximum utilization of resources and talents in the process of cultivating talents. Therefore, when formulating talent training objectives, HV colleges should be based on the overall direction of the professional system, and tap various resources needed for talent training according to the service
attributes of the regional economy. In addition, HV colleges should combine school education with social education, such as cultivating talents through school-enterprise cooperation. Of course, in this process, colleges and society should pay attention to the proportional relationship between matching degree and talent output degree in a specific period of time. This ability can effectively guarantee that the market environment can construct the corresponding training institution development system according to regional development planning in the process of change.

4.5.2. Formulate Specialized Curriculum System under the Guidance of Regional Economic Structure Optimization. HV education and regional economy are connected by specialty, so HV colleges should combine their own conditions and market demand in specialty setting. In terms of the form of higher education work, HV colleges should combine their own actual school conditions and cultivate students according to the needs of different majors in the market, including share profits, industry needs, skills needs, development needs, so as to realize the effective docking between majors and industries. Specifically, colleges should give priority to the following points in the construction of a talent training curriculum system. The first is the curriculum production system. The curriculum plays an important role in personnel training, which is the basic guarantee for...
students to achieve knowledge and skills and professional skills. Moreover, courses such as ideological and political education and professional skill education can establish correct professional concepts for students, so as to ensure that students can firm their own beliefs and achieve comprehensive development in learning and working. Therefore, in the process of curriculum production, the school should combine the professional attributes to form a teaching material curriculum writing group by school researchers and enterprise technicians and analyze the value and application direction of different professional courses in the specific implementation process, so as to improve students' professional quality. Secondly, the combination of curriculum theory and practice. For HV colleges, its role in the whole education system is more biased toward the education of applied talents. Therefore, in order to truly ensure that the supply of talents can meet the needs of regional economic development, colleges should ensure the accurate connection between theoretical knowledge and practical knowledge, so that students can transform their knowledge and skills into practical skills in the process of learning. This requires the school to strengthen the construction of a practice training base inside and outside the school. Among them, the campus practice training base mainly completes the simulation practice of the basic technical skills of students' professional positions, and the off-campus practice training base is to make students directly participate in the field training of actual production work. Finally, colleges should build a curriculum system combining online and offline education. This is not only conducive to the high utilization of students' fragmented time through the network but also can ensure the continuous development of continuing education in colleges. For example, colleges can develop high-quality core courses on educational platforms such as MOOC platforms and micro-course platforms, so as to expand the knowledge and vision of students.

4.5.3. Construction of Guarantee System of Talent Training with Regional Economy as the Development Index. The construction of a personnel training guarantee system is mainly aimed at the various carriers of personnel training and functions to give them relevant evaluation rights. From the perspective of students, it can be seen as a whole process supervision mechanism for students to complete their classroom work and realize comprehensive education, including teachers' supervision of students, mutual supervision between students, supervision of social departments, and supervision of supervisors in jobs. Through all-round control, students can understand their own problems in the development process. At the same time, such information can also provide data support for the development of the regional economic structure. By reflecting on the differences, it can play a certain role in promoting the regional economic structure and further strengthening the standardization of student training. The school must ensure that the teachers who undertake professional education and practical education have all kinds of knowledge and skills related to the development of the industry and their own professional development so that teachers can do as an example in the teaching process, so as to improve the teaching effectiveness.

5. Conclusions

Training talents for the regional economy is an important task of HV education. We use the professional comprehensive evaluation method to quantitatively evaluate the docking effect of talent training in HV education and regional economic development talent demand, which can objectively evaluate the current situation of the docking effect of applied talents training in HV education and regional economic development, and also provide a reference for the better coordinated development of the two in the future. Based on this, this paper establishes different levels of evaluation indexes for the training effect of applied talents in HV colleges. Taking into account the factors such as the teaching level of the school, the employment results and employability of graduates, and the satisfaction of the community, AHP is adopted to evaluate the overall effect of applied talents training in HV colleges. And, we provide some reference for HV colleges to understand their own level in all aspects of cultivating applied talents. This is conducive to the combination of training applied talents and regional economic development needs. The research conclusions of this paper are as follows.

First, we construct an evaluation index system of applied talents training effect in HV colleges composed of 16 influencing factors.

Second, we build a comprehensive evaluation model of applied talents training effect in A college, and the weighted score is 78.17 points, indicating that the overall effect of applied talents training in A college is at a medium level.

Third, on the basis of considering the regional economic needs, we put forward the optimization and promotion strategy of applied talents training mode in HV colleges in the future, including setting targets for talent training, formulating a specialized curriculum system and constructing a guarantee system of talent training.

However, because the theoretical knowledge and practical experience of this paper are not perfect, it is necessary to construct an evaluation index system for the training effect of applied talents in HV colleges from more aspects in the future, and adopt a more advanced weight calculation method and comprehensive evaluation method to determine the comprehensive score of the evaluation object, so as to find problems in the practical application more scientifically.

Data Availability

The data used to support the findings of this study are available from the author upon request.

Conflicts of Interest

The author declares that there are no conflicts of interest.
Acknowledgments

This work was supported by Foundation for Higher Vocational College Key Teacher by the Education Department of Henan Province, China: 434 Application of Modern Apprenticeship in the Training of Cross-Border e-commerce Talents for Business English Majors (Grant no. 2019GZZGG039).

References

[1] Y. Xu and A. Li, "Regional economic development coordination management system based on fuzzy hierarchical statistical model," *Neural Computing and Applications*, vol. 31, no. 12, pp. 8305–8315, 2019.
[2] B. Peng, "Regional economy using hybrid sequence-to-sequence-based deep learning approach," *Complexity*, vol. 2022, Article ID 9235012, 2022.
[3] M. A. Cardenete and J. Garcia-Tapial, "Assessing the economic impact of entrepreneurship on a regional economy using social accounting matrices: the case of Andalusia," *Applied Economics Letters*, vol. 26, no. 16-18, pp. 1373–1377, 2019.
[4] K. Liu, "The coordinated development of specialty settings and regional economy in higher vocational colleges-taking yang lin economic development zone as an example," in *Proceedings of the 2nd international conference on education research and reform (ERBR 2017)*, vol. 119, pp. 366–370, New York, NY, USA, April 2017.
[5] F. Li, "Influence of spatiotemporal difference and input of higher education on regional economy," *Discrete Dynamics in Nature and Society*, vol. 2021, Article ID 9515285, 11 pages, 2021.
[6] L. I. Teng-Juan, C. X. Liao, and M. Tang, "Current Dilemma and Countermeasure of College-Enterprise Cooperation in Higher Vocational Education," *4th International Conference on Education Science and Development (ICESD)*, 2019.
[7] T. L. Wu and J. Rao, "Research on the path of humanistic quality education in higher vocational colleges," *ICSSSD 2019* in *proceedings of the 2019 4th international conference on social sciences and economic development*, vol. 314, pp. 425–428, 2019.
[8] K. Janzen, R. Panitz, and J. Glückler, "Education premium and the compound impact of universities on their regional economy," *Research Policy*, vol. 51, no. 1, Article ID 104402, 2022.
[9] S. Paik and W. J. Shim, "Career education in vocational high schools," *Journal of Education*, vol. 40, no. 3, pp. 227–253, 2020.
[10] H. J. Cheon, "An AHP analysis of the priority of vocational literacy education needs - focused on engineering workers who took vocational higher education," *The Korean Journal of Literacy Research*, vol. 10, no. 3, pp. 663–691, 2019.
[11] S. Radosavljevic, V. Radosavljevic, and B. Grgurovic, "The potential of implementing augmented reality into vocational higher education through mobile learning," *Interactive Learning Environments*, vol. 28, no. 4, pp. 1–15, 2018.
[12] W. Sun, H. Cui, and C. Xu, "Innovative mode of integrated development of higher vocational education based on social interaction theory," *Karam ve Uygulamada Egitim Bilimleri*, vol. 18, no. 6, pp. 3043–3051, 2018.
[13] H. Peng, X. Peng, and X. Wang, "Research on the evaluation model of higher vocational teachers’ ability based on analytic hierarchy process," in *Proceedings of the 2017 2nd international conference on machinery, electronics and control simulation (MECS 2017)*, vol. 138, pp. 672–676, Taiyuan, China, June 2017.
[14] K. Lin and Z. Xie, "Discussion on strengthening the construction of practical training base in vocational colleges and promoting the training of skilled personnel," in *Proceedings of the 2018 International Workshop on Education Reform and Social Sciences (ERSS 2018)*, vol. 300, pp. 1–5, Chengdu, China, October 2019.
[15] Q. Li, "Analysis and practice on the training of key ability of students majoring in electronic information in higher vocational education," *Procedia Computer Science*, vol. 183, no. 4, pp. 791–793, 2021.
[16] L. Chu, Li Cheng, and K. T. Kim, “Thinking of the high-quality development of vocational education in less developed areas within the region: a case from lushui city, zhejiang Province, China,” *Korean Chinese Relations Review*, vol. 8, no. 1, pp. 61–84, 2022.
[17] B. Wei, "Investigation and Analysis of Training Quality of Graduates in Higher Vocational Colleges," in *Proceedings of the International Workshop on Advances in Social Sciences (IWASS)*, pp. 128–132, Surabaya City, Indonesia, October 2019.
[18] Y. Xu, "Research on student management model of higher vocational colleges based on cloud platform," *ITM Web of Conferences*, vol. 25, Article ID 02001, 2019.
[19] W. Liu, "Orientation and effect evaluation of higher education features based on regional economic development requirements – henan Province," *Educational Sciences: Theory and Practice*, vol. 18, no. 6, pp. 3819–3826, 2018.
[20] Bo Zhang and K. I. M. Tae, "Planning and development of local universities from the perspective of regional economy - a case study of Yanbian University and Changchun Jilin.Tumen opening and development strategy," *Journal of North-east Asian Cultures*, vol. 1, no. 69, pp. 171–185, 2021.
[21] O. Levchenko and I. Tsarenko, "The role of universities in cluster development of countries’ economy," in *Proceedings of the 2nd Central European Conference in Finance and Economics (CEFE)*, pp. 470–478, Herlany, Slovakia, September 2017.
[22] Y. Cao and H. Li, "The construction of evaluation indicator system on urban talent development potential," in *proceedings of the 2019 5th international conference on social science and higher education (ICSSHE 2019)*, vol. 336, pp. 1074–1077, Athens, Greece, July 2019.
[23] F. Wang, P. Liu, and P. Wang, "An evaluation study of rural scientific and technological talents based on TODIM method with hybrid indicator," *Journal of Intelligent and Fuzzy Systems*, vol. 40, no. 9, pp. 1–14, 2021.
[24] Z. Zhu, J. Gao, Y. Sheng, and Y. Wang, "Research on competency evaluation of accounting applied talents," in *proceedings of the 2019 5th international conference on social science and higher education*, vol. 336, pp. 403–406, Brisbane, Australia, August 2019.
[25] Q. Zhang, "Evaluation of comprehensive ability of accounting applied talents based on GAHP-cloud model," *Discrete Dynamics in Nature and Society*, Article ID 5643297, 2021.
[26] K. K. Naji, K. F. Al-Salahi, and M. Gunduz, "Evaluation of comprehensive ability of accounting applied talents," in *proceedings of the 2019 5th international conference on social science and higher education*, vol. 336, pp. 403–406, Brisbane, Australia, August 2019.
[27] M. Benbimir, M. Cherri, and D. Chenaf, "Managing sewerage networks using both failure modes, effects and criticality analysis (FMECA) and analytic hierarchy process (AHP) methods," *Canadian Journal of Civil Engineering*, vol. 48, no. 12, pp. 1683–1693, 2021.