

A Study on Quality Evaluation System of Training of Interdisciplinary Talents

-- Take the Major of Data Computation and Application as an Example

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Abstract

Different from the quality evaluation system of application-oriented talent training in a particular specialty, this paper considers the corresponding evaluation system of interdisciplinary talents. This system concentrates on various abilities of students and can give them appropriate guide for future academic development. Based on this, the graduates would be helped to stick the exclusive "specialty label" and have the better chance to be recommended.

Keywords

Quality Evaluation System; Interdisciplinary Talents Training.

1. Introduction

With the continuous development of social economy and improvement of delicacy talents training requirements driven by demand, the way employers evaluate the ability of college graduates, and the reputation and recognition of colleges from all walks of society including parents, have become urgent issues in the process of talents training. Under the rapidly changing situation, professional development and construction should put forth new ideas, so as to revitalize and embrace the opportunities and challenges. Therefore, in the implementation of training objectives and graduation requirements of interdisciplinary talents, students are expected to have solid professional qualities in diverse disciplines, strong competitiveness as well as sound development prospects in the future.

2. Necessity of Research on Quality Evaluation System of Training of Interdisciplinary Talents

In March 2012, *Opinions of the Ministry of Education Comprehensively Improving the Quality of Higher Education* (JG [2014] No. 4 Document) was issued by the Ministry of Education of the People's Republic of China. It clearly pointed out that the teaching quality and talents training quality of higher education should be further promoted. The training of application talents should be strengthened. All these efforts are made to promote the transformation of economic and social development, which is the top priority of the development and reform of colleges in China[1]. Referring to new requirements for the quality of talents training, it should be supported by related evaluation systems. Subsequently, the quality evaluation system of talent training is successively carried out and innovated by the teaching staff of colleges, thus making a series of research results.

An evaluation system was built by Hu Xiaoxu [2] et al. on the basis of such methods as analytic hierarchy process and practice feedback, so as to inspect the quality of talents training

performed by nine affiliated teaching units in light of quantitative analysis and qualitative evaluation. In the past, there were many problems in the quality evaluation system of talents training, involving taking scores as the center, single evaluation method and single evaluation subject. In view of this phenomenon, Zhao Wei et al. [3] proposed that the quality evaluation of talents in application-oriented colleges should include two elements: basic knowledge and practical ability, and the quality evaluation system of compound talents should be established featuring both the self-evaluation of colleges and the evaluation of employers. In the following year, Liao Minxia [4] explored the quality evaluation system for application-oriented talent training in various aspects, built diversified evaluation subjects with the participation of colleges, enterprises and society. In addition, the corresponding evaluation content and index system was also established, forming a quality evaluation system which features application-oriented talents training. As the concept of OBE develops in the teaching process, Jia Bing et al. [5] carried out the talent training practice of the social work profession and exploringly proposed the "three-thirds system" evaluation system framework of learning results, which is characterized by three aspects, three levels and three dimensions. Also, Lu Yi et al. [6] designed an ability-oriented talent evaluation index system for human geography and urban and rural planning majors, and tested the learning results of OBE.

Gradually, the quality evaluation system of talent training which is closely related to majors has been widely given attention. The analytic hierarchy process was applied by Zhou Min [7] to build a quantifiable evaluation index system for the cultivation of application-oriented undergraduate financial management majors. Xu Huadong [8] studied and constructed the quality evaluation system and evaluation index of talent cultivation for forest engineering major in the context of "Double Tops" construction from both the colleges and students. Liu Kaifeng et al. [9] initiated a quality evaluation index system for the training of application-oriented talents in mathematics majors from four aspects. Combined with the effective incentive mechanism, they achieved huge achievements in practical teaching. Furthermore, Luo Dan and Li Yong [10] also emphasized that it was necessary to guide teachers to change the evaluation concept and give full play to the main role of students in evaluation.

Data computation and application is a special major belonging to applied science and mathematics set up by the Ministry of Education in 2019. As a "new engineering", it is also an interdisciplinary major derived from three aspects including mathematics, statistics and data science. So far, there are no graduates majoring in data computation and application in China, and the literature on the quality evaluation system of interdisciplinary talent cultivation is very limited. Therefore, it is necessary to carry out related research work.

3. Research Content of The Quality Evaluation System of Training of Interdisciplinary Talents

The literature mentioned above mainly studies the quality evaluation system of application-oriented talent training in a particular specialty, while this paper tends to focus on exploring the quality evaluation system of interdisciplinary, especially data computation and application majors. It is noted that the role of self-evaluation and process evaluation in the process of talent training will be strengthened, so as to study the interdisciplinary talent training model that adapts to the needs of the new era.

1. Guided by the needs of social and economic development, we should establish the direction of talents training, set up curriculum system and professional courses scientifically. With the training objectives of outstanding talents, the quality evaluation system of the interdisciplinary talent training including data computation and application will be further explored.

There are three parts in the whole evaluation system: academic goal, evaluation index and feedback effect. To be specific, the academic goal indicates the student's expected learning

outcomes or abilities; Evaluation index refers to the evaluation standard of achievement or ability and its detailed scoring method; As for feedback effect, it means to feedback the ranking and grade of all students in various aspects with digital ways, while reflecting the shortcomings of teaching activities.

2. All teachers are aimed to promote the implementation of the evaluation system, ensure that all students have a good understanding of the content of the evaluation system, the process and objectives of talents training. With these works, it can encourage teachers to truly participate in the individual development of students, and give full play to the guiding role of academic mentors.

Firstly, various abilities should be fully given attention involving mathematical logic literacy, statistical decision and analysis, programming thinking and operation, English expression and writing, as well as good organization, coordination and management, that is to say, detailed classification of academic goals.

Secondly, a detailed evaluation index should be set, namely the quality evaluation framework for talents training, which can be graded and accumulated according to various abilities and levels. Moreover, the index should consider all aspects of professional courses, academic competition, qualification and other skills as well as the corresponding level.

Finally, the feedback effect can clearly show students' information such as interests, abilities, class or ranking in various aspects, which can provide specific guidance for the future choice of professional courses, academic development, employment and enrollment planning.

Obviously, this evaluation system not only attaches importance to the overall development of students, but also fully considers the personalized training, which is different from common evaluation method featuring the academic grade point average.

3. On the basis of solid professional knowledge, the cultivation of students' practical ability should be put on top of the agenda. Core links involving major competitions, skill competitions, and qualification certification should be vigorously publicized to attract more students, thus promoting further learning through competitions. At the same time, it aims to advocate healthy competition, and foster positive academic atmosphere. Of course, if appropriate, material rewards may be given.

Besides, the professional advantages of science and education integration should be given full play. Referring to the needs of co-construction units, we should provide a new model of school-enterprise integration and cooperative training. With mature conditions, we should draw a consensus on supply and demand with the units, sign the training agreement, and set up the cooperative class, named class and other forms.

4. Research Significance of The Quality Evaluation System of Training of Interdisciplinary Talents

Generally speaking, teachers evaluate the overall academic level of students through grade point average. However, this method is not suitable for students in this major. This is because it cannot highlight excellent performance of students in light of mathematics, statistics and data science, and cannot provide targeted guidance for postgraduate entrance examination, employment and job selection.

Concentrating on the personalized development and ability improvement of students, the quality evaluation system of training of interdisciplinary talents can reflect the phased achievements of students in many aspects and processes, and effectively feedback their strengths and weaknesses, showing an obvious positive effect on promoting their effective learning and potential.

1. The delicacy system of talents evaluation can effectively advance students' learning, promote their strengths and academic development. First of all, some students lack desire to advance and have a state of lying flat. Second, they don't feel the awareness of anxiety occurred in the future workplace competition. Therefore, with the help of the delicacy system of talents evaluation, students are encouraged to accurately understand their own weaknesses and strengths. Moreover, we advocate the idea of "interest is the best teacher", promote underachievers to keep learning enthusiasm, and give play to the inherent potential of students with special skills.

2. On the one hand, the delicacy process of talents training can reflect the quality of talents training in real time, objectively and effectively. On the other hand, delicacy guidance is made for the selection of professional courses, academic development, employment or college planning in the future. In doing so, there efforts made tend to comprehensively improve the employment rate and the level of employment, especially in the high-end employment breakthrough. Meanwhile, the delicacy academic guidance will help them stick the exclusive "specialty label", which will be more conducive to the recommendation of outstanding graduates, so as to enhance the social visibility and reputation of both colleges and majors.

Scholars once pointed out that "a scientific talent evaluation system should be a combination of quantitative and qualitative analysis through evaluation items, evaluation indicators, sample selection and so on. And it should evaluate the objectivity, fairness and effectiveness of the whole process of talent training from the aspects of teachers' teaching, students' learning, and learning management", that is to say, it should fully reflect the "people-oriented" development concept.

It is believed that in the next few years, under the guidance of quality evaluation system of training of interdisciplinary talents, students' learning attitude will change greatly. And breakthroughs will be made in professional competition, skill competition, qualification authentication and other aspects. More important, the quality of talents training and professional education will be elevated as a whole.

Acknowledgments

The work on this project was funded under the Development Projects of Qilu University of Technology (Shandong Academy of Sciences) (Grant No. 2422140301) and the Teaching and Research Projects of Research and Development Center of College Mathematics Teaching in University (Grant No.CMC20210407).

References

- [1] China Education News-Opinions of the Ministry of Education on Comprehensively Improving the Quality of Higher Education., 2012-04-01(01).
- [2] X. X . Hu, P. Zhao, D. Yan: Study of Construction on Education Quality Evaluation System Based on Teaching Department, Journal of Liaoning Provincial College of Communications, vol.16 (2014),48-511.
- [3] W. Zhao, G.Z. Song, X.Z. Du: On Strategies to Construct an Evaluation System for Talent Training in Applied Colleges and Universities, The Science Education Article Collects, vol. 310 (2015),25-26.
- [4] M.X. Liao: Research and Practice on the Construction of Quality Evaluation System in Applied Talents Training, Vocational & Technical Education Forum, vol. 23 (2016), 55-59.
- [5] B. Jia, X.D. Chen, H. Li: Construction and Practice of the Evaluation System of Professional Learning Outcomes under OBE, The Guide of Science & Education, vol.8 (2017), 42-44.

- [6] Y. Lu, Y.J. Zhang, H.Q. Han: Construction of Quality Evaluation System of Talent Cultivation of Human Geography and Urban-rural Planning Majors Guided by OBE, *Journal of Heilongjiang Vocational Institute of Ecological Engineering*, vol. 31 (2018), 135-137.
- [7] M. Zhou: On Quality Evaluation System for Training Financial Management Talents in Application-Oriented Undergraduate Colleges, *Journal of Heihe University*, vol. 11 (2019), 104-105.
- [8] H.D. Xu, N.Z. Chen, G.Q. Xu, H.T. Di: Research on Quality Evaluation System of Forest Engineering Talents Cultivation Under the Background of "Double First-Class", *Journal of Social Science of Jiamusi University*, vol. 39 (2021), 187-191.
- [9] K.F. Liu, Y. P. Zhu, J.H. Wang: Research on Quality Evaluation System of Mathematics Application Talents Training, *Journal of Higher Correspondence Education(Nature)*, vol. 23 (2010), 16-18.
- [10] D. Luo, Y. Xi: Research on Quality Evaluation System of Talent Cultivation for Applied Mathematics Major in Applied Technology Colleges and University, *Dang Dai Jiao Yan Lun Cong*, 2017, 8-9.