Retraction

Retraction: The construction of evaluation system for the cultivation of statistics professionals under the background of big data and artificial intelligence (J. Phys.: Conf. Ser. 1748 032034)

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The authors of the article have been given opportunity to present evidence that they were the original and genuine creators of the work, however at the time of publication of this notice, IOP Publishing has not received any response. IOP Publishing has analysed the article and agrees there are enough indicators to cause serious doubts over the legitimacy of the work and agree this article should be retracted. The authors are encouraged to contact IOP Publishing Limited if they have any comments on this retraction.

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The construction of evaluation system for the cultivation of statistics professionals under the background of big data and artificial intelligence

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Abstract. The high development of big data and artificial intelligence has put forward higher requirements for statistical talents, and the quality of statistical talents needs to be further improved. Based on the present situation of statistics teaching in our country, this paper takes the cross characteristics of big data and artificial intelligence as the research background, and aims to break through the evaluation model that regards the evaluation of teachers teaching work as the only evaluation content, to promote the four substantial transformations of the subject of judgment, the objective of judgment, the content of judgment and the object of judgment, meanwhile, to set up the corresponding index system.

1. Introduction

In 2012, the United States proposed the Big Data Research and Development Initiative, which plans to invest $200 million in data mining, analysis and other technologies. In 2014, Japan issued the Talent Training in the Age of Big Data, and the proposal discussed in detail around the era of Big Data and talent training. In 2017, Wuzhen held the fourth Internet Seminar on the theme of "Artificial Intelligence, Better Life". At the International Conference on Big Data, Artificial Intelligence and Internet of Things Engineering held in 2020, experts discussed the frontier technology and academic development trend in depth. All kinds of signs show that the future must be the era of big data and artificial intelligence vigorous forward, and data has a natural relationship with statistics ushered in a new opportunity for development, at the same time, high-end statistical talent demand gap will increase.

In order to fill the gap of demand for statistical compound talents in the information intelligent society and meet the needs of statistical analysis talents in the era of big data and artificial intelligence, colleges and universities in China actively adjust to the traditional statistical personnel training mode, for example, statistics teachers seriously inadequate to adapt to the era of big data and the development of artificial intelligence[2-3], unreasonable of set up subjects of professional courses and computer courses and distribution of class hours[1], teachers pay too much attention to teaching derivation and ignore tool application[5].

However, it is a difficult and long process to cultivate high-end compound statistical talents to meet the social development of massive data, which requires not only the innovation of teaching system in Colleges and universities, but also the development of a sound and reasonable talent training evaluation system to verify and improve the quality of statistical talents.
2. Principles for the Construction of Statistical Talents Training and Evaluation System Based on Big Data and Artificial Intelligence

At present, for the evaluation system of personnel training adopted by colleges and universities, the main body of evaluation only considers college students, internal personnel and internal teaching management system of colleges and universities, but neglects the consideration of employing units and government educational administrative agencies; the evaluation goal only includes the quality of teachers' teaching work, but not the comprehensive evaluation of the quality of school running work; the content of evaluation only includes the teaching plate of teachers; the object of evaluation is only for full-time teachers in colleges and universities, but omitting the evaluation of counselors, professional development teaching and research offices and so on. Therefore, we must first promote the substantive transformation of the following four angles.

2.1. Substantive transformation of the main body of judgment-extending from inside to outside the school

University is not only a step to promote each individual's gradual self-improvement and academic attainment, but also a component of this grand social system. The evaluation of their training methods and talent quality should also be included in the social environment for verification, so that the social environment can be added to the evaluation and supervision. Therefore, the main body of evaluation should extend from college students, college internal expert system and college teaching management organization to college students, college expert organization, social employment organization and government educational administrative organs (structure), so as to promote the substantive transformation of the main body of evaluation (Fig. 1).

2.2. Substantive transformation of evaluation objectives-from isolated evaluation of teachers' teaching quality to comprehensive evaluation of school professional work quality

The purpose of teaching evaluation in colleges and universities is to improve the quality of professional education, however, in the practical level, it often judges teachers' education and teaching work in isolation, and even links its results with teachers' rewards and punishments. Thus, this measure eventually gradually evolved into a rigid means of "managing teachers" in colleges and universities, which completely distorted the essence of evaluation. To rectify this mode, the first step is to complete the substantive transformation of the evaluation goal, that is, to expand from the only emphasis on the evaluation of teachers' educational and teaching work to the comprehensive evaluation of the whole professional personnel training work in Colleges and universities (Fig.1).

2.3. The substantive transformation of the evaluation content-from the teaching module to the various links of professional education

The substantial change of the objective of judgment must lead to the enlargement of the scope of judgment, from the original single evaluation of teacher education to evaluation of the allocation of teaching resources, the structure of teacher teaching system, teaching service management and other aspects, so as to form an all-round analysis of the assessment of the top talent cultivation path facing many problems (Fig.1).

2.4. Substantive conversion of the object of judgment-from the only constant object of judgement to the flexible and changeable object of judgement

If the evaluation work breaks through the shackles of single assessment of teachers' teaching work and sublimates to the comprehensive level of evaluating the quality of professional running, the scope of evaluation object will be expanded. That is to say, the object of evaluation will extend from the original only unchanged teacher to teachers, professional development teaching and research office, teaching administration organization, counselors, teaching assistants and the whole educational and teaching participants (Fig. 1).
3. Construction of the Evaluation System

As a set of comprehensive supervision system, the evaluation system of statistics professional training focuses on improving the quality of teachers' education and teaching, optimizing the construction of curriculum system, rationally using teaching resources, improving the quality of school teaching service and management, and ultimately improving the level of students and professional school running quality. The structure of this set of system covers two steps, the first step is the structure of the evaluation operation system, the second step is the establishment of the evaluation index system.

3.1. The structure of the evaluation operation system

The evaluation of the quality of professional personnel training is very complex. The evaluation system of statistics professional personnel training is not only the teacher education and teaching in colleges and universities as the evaluation content, but also with the characteristics which evaluation of the main and object and evaluation index is flexible. Therefore, the scientific and objective evaluation of the training quality of statistical professionals must be based on a set of reasonable and objective evaluation system. Referring to the evaluation system of professional talents constructed by Lin Shiping and combining with the characteristics of statistics specialty, the evaluation operation system of statistics specialty shown in Fig. 2 is constructed.

Figure 1 Schematic diagram of talent evaluation system transformation

Figure 2 Schematic diagram of evaluation operation system
According to Figure 2, the whole evaluation system is divided into two steps, the first step is to evaluate the quality level of statistics graduates, which is implemented by the employment management organizations of universities, social employment organizations and government education administration agencies, and to evaluate the knowledge, ability and quality of statistics graduates from the two perspectives of off-campus evaluation and on-campus evaluation. Employment organizations and government educational administration organizations are the main body of outside school evaluation, while employment management organizations of colleges and universities are the main body of inside school evaluation. The purpose of quality evaluation is to test and verify the quality level of graduates, around this goal, we can test and verify the effectiveness of professional personnel training, grasp a series of difficulties and problems in the path of statistical personnel training in real time. After the completion of the evaluation of the quality of statistical graduates into the second step of the evaluation system--The school self-evaluation. The school's self-evaluation is organized and implemented by the professional academic committee and the academic branch of statistics specialty in Colleges and universities, and the whole training system of statistics specialty in Colleges and universities is comprehensively evaluated. Specifically, the professional academic committee and the academic branch of statistics specialty of colleges and universities lead the relevant functional departments (professional departments, educational administration, scientific research, students and other organizations) in the school according to the evaluation results of the employment management organizations, employment organizations and government educational administrative agencies on the quality level of statistics graduates from the perspective of "teaching resource allocation, curriculum system construction, teacher teaching, teaching management services" to comprehensively analyze, test and discuss the root causes of the trained statistics professionals not meeting the social needs, and on this basis, formulates the corresponding scheme of continuously optimizing the personnel training plate system.

3.2. Establishment of the evaluation index system

On the basis of smoothing the evaluation operation system, which criterion is used to judge the status of the evaluation object is the key to determine whether the evaluation system is scientific and reasonable, and whether the way of personnel training meets the needs of statistical personnel training. For this reason, on the basis of completing the structure of the evaluation operation system, according to the different evaluation objects and evaluation emphases, seven first-level indexes of knowledge, ability, quality, curriculum system, teacher teaching, resource allocation and service management and several second-level indexes (Table 1) will be set up.

Table 1: List of evaluation index system

| judgement abject | content of evaluation (first level index) | secondary index |
|------------------|------------------------------------------|-----------------|
| knowledge        | basic knowledge                          | whether to pass the examination, subject knowledge contest, professional knowledge contest winning times |
|                   | professional knowledge                    |                 |
|                   | computers, foreign languages             | whether relevant certificates have been obtained |
| graduates         | graduation project                       | Is it an excellent graduation project? |
|                   | software operation                        | flexibility     |
|                   | communication expression                  | flexibility, fluency |
| ability           | innovation and entrepreneurship           | the number of awards in innovation and entrepreneurship competitions, the number of successful self-employment, the number of papers and patents |
|                   | leadership ability                        | number of class cadres, students' union and community |
|                   | professional skills competition           | number of awards |
| quality           | personal morality                         | qualified or not |
| social morality                                      | the number of violations of law and discipline, the number of young volunteers participating in activities, and the number of other contributions to society |
|-----------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| psychological quality                               | whether to pass the mental health test                                                                                                |
| team spirit                                          | class activities, community activities, team work participation                                                                          |
|                                                      |                                                                                                                                               |
| curriculum system                                   |                                                                                                                                               |
| basic courses                                       | rationality, proportion of school hours and satisfaction of market demand                                                                  |
| specialized courses                                 |                                                                                                                                               |
| integrated curriculum                               |                                                                                                                                               |
|                                                      |                                                                                                                                               |
| teacher teaching                                    |                                                                                                                                               |
| preparation before class                            | sufficiency                                                                                                                               |
| teaching content                                    | relevance, depth, extension, readiness                                                                                                         |
| mode of teaching                                    | flexibility, diversity                                                                                                                     |
| work attitude                                       | enthusiasm, enthusiasm                                                                                                                     |
| student judgement                                   | favorability, attraction, knowledge mastery                                                                                               |
| student achievement                                 | examination pass rate, number of awards in related disciplines competitions                                                                |
|                                                      |                                                                                                                                               |
| teaching staff                                      |                                                                                                                                               |
| teacher-student ratio                               |                                                                                                                                               |
| proportion of highly educated teachers              |                                                                                                                                               |
| professors and associate professors account for the proportion respectively |                                                                                                                                               |
| proportion of teaching team above provincial level  |                                                                                                                                               |
| proportion of famous teachers at and above the provincial level |                                                                                                                                               |
| input of teaching funds                             | proportion of funds for professional practice                                                                                           |
| proportion of funds for academic exchange           |                                                                                                                                               |
| proportion of teachers’ research funding            |                                                                                                                                               |
| proportion of equipment purchase and maintenance cost |                                                                                                                                               |
| facilities equipment                                | number of specialized classrooms and laboratories                                                                                         |
| access to intangible resources                      | school popularity and honor                                                                                                                |
|                                                      |                                                                                                                                               |
| scientific research management                      | number of excellent courses developed                                                                                                       |
| number of scientific research team                  |                                                                                                                                               |
| number of patents, papers                           |                                                                                                                                               |
| market conversion rate of scientific research achievement |                                                                                                                                               |
| student learning consultation                        | number of famous teachers at provincial and school level                                                                                  |
| students’ moral education and life management       | number of ideological and political education, psychological consultation, professional ethics education, campus cultural activities, community activities and work-study organizations |
| enrollment and employment management                | the proportion of non-key and key universities in high school                                                                           |
| graduation rate                                     |                                                                                                                                               |
| employment rate                                     | institutions, top 500 enterprises and other enterprises account for the proportion respectively,                                            |
The judgment operation system guides colleges and universities to judge the quality of professional personnel training and the personnel training system according to the process, and the establishment of the index system establishes the quantification of the quality of graduates and each plate of the personnel training system, both of which constitute a whole set of personnel training judgment system, which can be used to make a comprehensive and detailed judgment on each module of personnel training in Colleges and universities and find out the parts that do not meet the requirements of professional training and then adjust and correct them in time. Finally, a new professional training system is formed, which is in line with the economic and social development.

4. Conclusion
For the whole set of statistics professional training operation system, the evaluation mechanism is the fundamental way and direct yardstick to verify the excellence of talents, playing the role of the key part of the whole statistics professional training plate system. Under the background of big data and artificial intelligence, although the teaching of statistics in China has made rapid development and breakthroughs after continuous exploration, adjustment and innovation, there are still a series of problems in the evaluation of personnel training quality, which deserve our consideration and improvement. Based on this, this paper combines the relationship among big data era, artificial intelligence and statistics, draws lessons from the relevant excellent evaluation index system at home and abroad, takes the construction of statistics professional training evaluation system as the breakthrough point and research goal, aiming at improving the quality of personnel training, breaks through the limitation that the previous teaching evaluation only focuses on the evaluation of teachers’ teaching work and evaluates every part of the school-running work of statistics specialty in an all-round way.

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