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Research on the competency level of teachers' intelligent educational technology in private colleges and universities in Shandong province

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Abstract: *The development of a new generation of information technology combined with teaching has not only changed the sharing of teaching resources, the construction of the environment, the setting of disciplines and majors, and students' learning, but also had a profound impact on the reform of the school's philosophy and mechanism. In order to promote the construction of the teaching staff of private colleges and universities in Shandong Province and promote intelligent teaching in the new era, the author analyzes and discusses the concept of "adaptation". The research found that in terms of intellectual education technology quality, the intellectual quality level of teachers in private colleges and universities across the province is above the average level. In terms of innovation ability, the professional skills and skills of teachers in private colleges and universities are an effective way to explore and innovate intelligent education technology.*

Keywords: *Intelligent education; Competency level; Private higher education; Ant colony*

1. Introduction

Intelligent education informatization is an important part of modern education system and an important means to realize education modernization. However, the improvement of teachers' quality of intelligent educational technology requires a long time of practice. As the "capital of intelligent education in China".Under the background of intelligent education, it is a problem and challenge for private higher education to provide high-quality and efficient teaching resources for its teachers and students, as well as teachers' professional development.

Some studies have explored the need to identify learning difficulties, especially reading difficulties, writing difficulties and computational difficulties. Under the guidance of psychologists, children were screened in a series. Recognize that learning difficulties is a very difficult thing; This will have a impact on children's academic progress and performance. Sarthika Dutt introduced ITS, which is used discover problems in learning and use it to teach people with learning difficulties. This is an area that not been studied yet [1]. With the continuous emergence of new technologies such as the Internet of Things, big data analysis, artificial intelligence, cloud computing, intelligent teaching platforms and networked teaching platforms are increasingly favored by people. Xu Liu believes that in order to real-time services, we should actively develop the communication efficiency and security of intelligent education systems. The traditional sports intelligent motion evaluation method has some problems, as unclear teaching tasks and inattention to annotation, which results in calculation errors and time-consuming and laborious traditional sports training methods [2]. For this reason, Jiang De kun designed a new evaluation method of motion intelligence, which has been applied in the evaluation of motion intelligence teaching [3]. Therefore, teachers need to strengthen the training of corresponding ability and theoretical innovation ability in the process of learning and researching AI knowledge and applying cutting-edge technology.

Its overall level still lags far behind other regions in the province. On the one hand, there are differences in the educational concept, knowledge structure, educational concept, teaching style and level of teachers in private colleges and universities. On the other hand, with the continuous deepening technological evolution and application in the era of artificial intelligence, as well as the widening of gap between the demand for educational innovation and the talent training objectives of private and universities, etc. On the other hand, teachers in private colleges and universities have strong technical knowledge reserves and innovation ability. Although most private higher education teachers

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have corresponding professional knowledge and skill systems, it is difficult to obtain relevant information and practical skills due to the lack of corresponding knowledge system framework and reserves of corresponding resources.

2. Research on the competence level of intelligent educational technology

Artificial intelligence is profoundly changing the world, changing the way people live and work. In this context, education informatization is an important starting point for the country to promote education modernization, build an education power, and serve China's innovative country and the world's science and technology power. It clearly pointed out that the three-step strategic goal of "achieving major breakthroughs in scientific and technological innovation" and "realizing China's transformation from a big country in higher education to a powerful country in higher education.", Therefore, it is one of the most important and urgent issues to study how to improve teachers' professional quality in the context of intelligent education technology and the professional development brought about by it. At present, the number of private colleges and universities in China has reached 158, and larger private colleges and universities such as Shandong University. However, there are many teachers in private colleges and universities, and there are also some problems and challenges [4-5]. Among them, the most prominent is that due to its own characteristics and private attributes, teaching research and talent training are facing greater challenges. In order to better serve the development of intelligent education in the new era, this paper, based on the relevant research results of predecessors, uses the questionnaire method to analyze and study the competency level of teachers' intelligent education technology in private colleges and universities in Shandong Province in recent two years, and puts forward the following assumptions:

Hypothesis 1: What is the level of teachers' ability to apply intelligent educational technology? What are its characteristics and future development prospects? This phenomenon exists between people with high level of intelligent education development and people with low intellectual disabilities; Intelligentization has been included in the key R&D program of the Ministry of Education; A new round of scientific and technological revolution and industrial transformation represented by intelligent education in the new era has a profound impact on the education sector and the overall thinking of basic education and the construction of teachers' team [6-7]. In this paper, the pressure on teachers' professional development brought by AI is not limited to a series of problems such as insufficient professional knowledge and skills of teachers in traditional teaching and unskilled in the process of technology application; And teachers' cognition and mastery of the application field of artificial intelligence directly determine their final learning effect, which is one of the most critical tasks in the construction and deepening reform of intelligent education. Therefore, it is necessary to understand and master the current private colleges and universities' assessment of teachers' competency and future intelligence in the intelligent education stage. 2. Empirical analysis this study selects four private undergraduate colleges and universities among private colleges and universities for random selection, and evaluates their teachers' intelligent education technology competency level. Using descriptive statistics and correlation analysis methods, this paper analyzes the competency level of teachers in private colleges and universities in Shandong Province. The sample is composed of our existing full-time teachers and undergraduates of related majors. Statistical analysis shows that most teachers in private colleges and universities have problems such as weak curriculum foundation, lack of professional knowledge, and single teaching methods. Among them, the problems are the most prominent, and with the change of information technology application environment, the school running philosophy, school running mode, teacher allocation, teaching content and curriculum system will have profound changes, and these factors will have a direct impact on teachers' intelligent education technology competency level [8]. Therefore, teachers' cognition of adapting to the concept of intelligent education and their competence level of intelligent educational technology are taken as the evaluation indicators of teachers' professional level to judge the degree of teachers' adaptation to the development of the school.

3. Experimental Design of the Competency Level of Intelligent Education Technology for College Teachers

The establishment of a model for the quality of teachers in private colleges and universities in Shandong Province, and through interviews, surveys, evaluation and other methods, can make a more comprehensive and objective assessment of the status of teachers in private colleges and universities in

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Shandong Province, which is conducive to a better understanding of the quality of teachers in private colleges and universities in Shandong Province, so as to better cultivate and improve the abilities of various teachers, make them more compatible with their jobs, and effectively prevent blindness in work, Reducing mistakes in work has provided strong support and guarantee for the healthy and rapid development of private colleges and universities in Shandong Province [9-10].

Therefore, this paper takes students as the evaluation object, and adopts quantitative survey methods to analyze the cognitive ability, overall planning, information acquisition and other aspects of the survey; This paper collected a total of 300 questionnaires on teachers' competency, 265 of which were effective, with an effective rate of 88.3%.

Among the returned questionnaires, 175 boys (58.3%), 125 girls (41.7%), 148 urban students (49.3%), 152 rural students (50.7%), 138 sophomores (46%) and 162 junior students (54%). See Table 1 [11] for the specific distribution.

Table 1: Distribution of samples

type	frequency	percentage
male	175	58.3%
female	125	41.7%
city	148	49.3%
countryside	152	50.7%
Sophomore	138	46%
Junior	162	54%

The update of pheromone adopts max min rule. In the traversal of ant colony algorithm, only the most suitable ants are added with pheromone. A binary group (X, D) was used to express the age change of information density.

$$D = \left\{ D(x_{ji}, e) \middle| D(x_{ji}, e) \in K. j = 1,2,...,n, i = 1,2,...,m \right\} \tag{1}$$

x_{ji} refers to a test question. D is the collection of tracks of pheromones, c is 0 or 1, and $D(x_{ji}, e)$ is the pheromone whose test question x_{ji} is selected or not.

D can be represented by a two-dimensional matrix:

$$\begin{bmatrix} D(x_{11},1), D(x_{12},1)...D(x_{1m1},1)...D(x_{mnm},1) \\ D(x_{11},0), D(x_{12},0)...D(x_{1m1},0)...D(x_{nmn},0) \end{bmatrix}_{2*\sum_{j=1}^{n} m_j} \tag{2}$$

4. Experimental Analysis on the Competency Level of Intelligent Education Technology of Teachers in Colleges and Universities

4.1 Measurement and analysis of college teachers' competency

Consistency refers to whether the survey results are consistent in the same research project. The high consistency shows that the respondents have conducted different questionnaires on the same items in different questionnaires, and obtained a high positive correlation; Stability refers to the correlation between the results measured repeatedly by the same respondent at different times. When the respondents receive the same questionnaire at different times and in different spaces, the difference in the results is small, indicating that the stability of the questionnaire is better. By analyzing the reliability of 265 retrospective questionnaires and using the reliability factors to analyze the reliability of the questionnaire, the clonal Bach factor 0.853 is obtained, which shows that the questionnaire has high reliability and consistency.

That is, the questionnaire can reflect the specific concepts and characteristics that the researchers want to measure. As shown in Figure 1, this paper uses SPSS13.0 to make statistics on 300 questionnaire data, and uses the principal component analysis method to extract a total of 10 factors with significant eigenvalues or above, and their cumulative contribution rate of variance is 55.155%. This shows that the 10 factors meet the needs of the questionnaire in structure and have certain

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explanatory power.

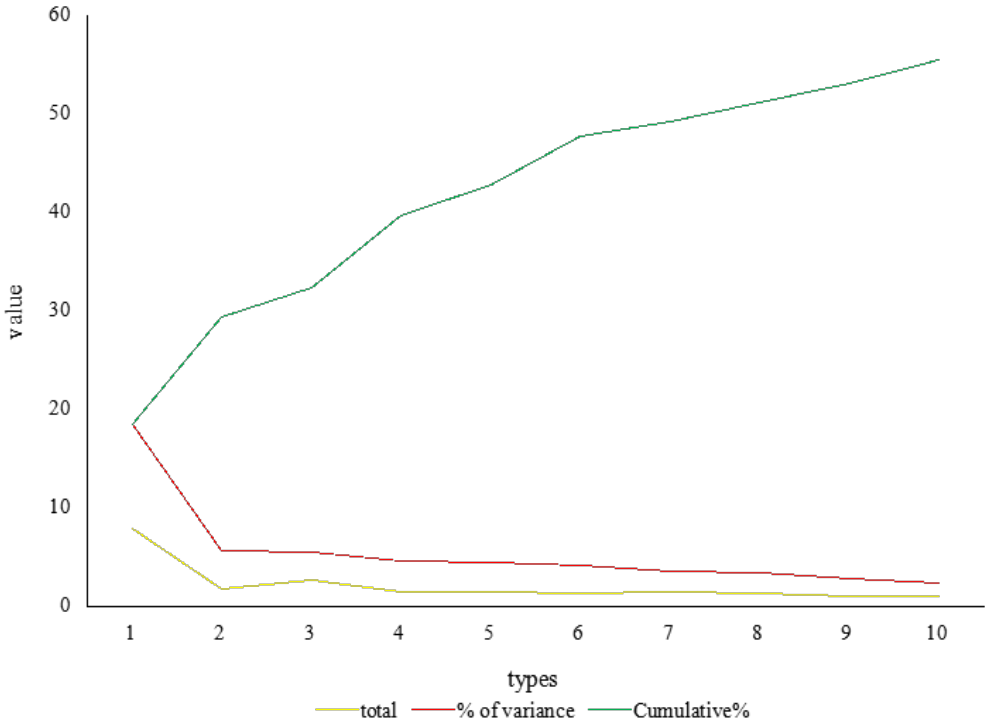

Figure 1: Initial characteristic values

Because each capability characteristic contains corresponding initial variables, the average value of each capability characteristic can be used as the index of the capability, and then the weight of each capability index can be obtained according to the score of each capability characteristic (see Table 2), thus laying the foundation for the establishment of the capability model in the future.

Table 2: Scores of Competency Characteristics

Competency characteristics	Number of variables	Total variable score	Competency characteristics score	Weight%
Research characteristics	9	15.48	1.71	21.8%
Teaching characteristics	7	13.26	1.68	20.4%
personality characteristics	7	12.28	1.66	19.5%
Knowledge characteristics	7	12.11	1.70	19.2%
Social characteristics	5	10.62	1.63	19.1%

Through the analysis of teachers' competency level of intelligent educational technology and suggestions on teachers' professional development, we can draw the following conclusions:

The level of teaching quality is related to the degree of teachers' adaptation to intelligence: with the change of teaching content and learning mode, teachers are faced with low level needs due to insufficient updating of teaching methods, contents and means. Therefore, the school needs to reform the teaching content, teaching methods and teaching methods to adapt to the background of intelligent education technology. On the other hand, teachers need time and practical opportunities to cope with new challenges and learn new knowledge. Therefore, schools should organize practical activities with intelligent educational technology as the core element. Therefore, teachers should formulate and practice their own development strategies and strategies under the leadership of the school. Form the concept of independent innovation in teaching activities. Private higher education should be matched and optimized with individual teachers in terms of ideology, cognitive ability, skills and teaching methods, so as to achieve professional growth, continuous improvement and promotion. At the same time, we should also strengthen theoretical learning, practical training, and social interaction support,

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resource sharing and other measures to establish a scientific and effective competency model of teachers' intelligent education technology. In order to comprehensively improve the competence level of teachers in Shandong private colleges and universities in intelligent education technology and bring positive effects on the adaptability.

4.2 Suggestions

The premise for the development of intelligent educational technology is that teachers have solid professional knowledge and skills, actively explore and implement the application of intelligent educational technology in education and teaching. The teaching staff is the core and foundation of the school development. As intelligent education technology belongs to an emerging field and there is no mature application method for reference and experience reference and practice, the following development suggestions are made for the issue of teachers' competency level of intelligent education technology in private colleges and universities:

First of all, further strengthening the awareness of technical knowledge reserve and innovation ability training is the main reason for the insufficient level of intelligent education technology competency in private colleges and universities. First of all, we should make clear our own position and mission, which has clear guidance and requirements for the reform of teaching modes and methods in the era of artificial intelligence. Therefore, it is necessary to constantly innovate ideas, methods and models in education and teaching practice, so that teachers can truly grasp the core concepts and essence of intelligent education and can apply them to education and teaching practice.

Secondly, we need to achieve the renewal of technical knowledge through continuous innovation and apply and promote new ideas and methods to improve teaching quality;

Secondly, under the background of the era of artificial intelligence, teachers themselves need to have strong innovation ability and rich professional knowledge accumulation; And they can constantly optimize their professional skills and cognitive literacy, which is the core competitiveness of school development and teacher development. Therefore, in terms of teacher team construction, teachers need to constantly improve their intelligent educational technology literacy in order to better serve the needs of education and teaching reform and the realization of talent training objectives and adapt to the needs of the development of the times.

Finally, it is necessary to make scientific summary and analysis of research results in order to put forward relevant countermeasures and suggestions in time to promote the improvement of intelligent education technology competency and further improve the school teaching governance system.

5. Conclusions

Through this study, we found that private colleges in Shandong Province still have some differences in the field of teachers' intelligent educational technology competency. The overall level of intelligent educational technology competency of university group teachers is high, and the basic level is also high, but the proportion of teachers at the middle and lower levels is not high. This shows that schools need to strengthen teachers' AI application training and practical exercise in various forms to improve teachers' quality and provide help and support for promoting universities to better serve the development of intelligent education in the new era. Through the analysis of the competency level of teachers in private colleges and universities in Shandong Province, it can be seen that, on the whole, teachers adapt to a higher degree of intelligence, but with the change of teaching content and form, the competency level is generally declining. At the same time, there are differences in teachers' mastery of new teaching methods, new methods and learning strategies. Schools should provide targeted guidance when training teachers to actively adapt to the wave of new intelligent technology and put forward higher requirements and training objectives for teachers' professional ideas, teaching methods and teaching organization forms, so as to help teachers establish teachers' professional development mechanism, training objectives and curriculum system in the era of artificial intelligence.

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