# Improving College Teachers(CT) Information-based Teaching Ability in the Era of Artificial Intelligence(AI)

Shan Wang[1,*]

[1]*Xi'an Academy of Fine Arts,Xi'an,710065,Shaanxi,China*
*41083@xafa.edu.cn*

**Abstract:**
With the transformation of the fourth generation information technology represented by cloud computing, big data and AI, higher education has gradually entered the stage of intelligent development, which puts forward higher requirements for the teaching ability (TA) of CT. Therefore, the research on the improvement of CT TA from the perspective of AI plays a good role in improving the teaching quality of higher education in China. This paper discusses the main characteristics of AI teaching and the advantages of AI for physical teachers to improve their TA, and analyzes the promotion strategies of CT information-based TA. Through the analysis experiment of CT information-based TA under AI, It is concluded that most of the tested teachers have mastered the skills to analyze the learning status and learning level of college students; Some of the tested teachers lack the ability to analyze the teaching objectives of emotional attitudes and values, so it is necessary to strengthen the cultivation of teachers' ability in this regard. In general, from the perspective of AI, most teachers' information-based TA has been improved, which has trained the teachers and integrated the teachers, so as to improve the TA of CT and lay the foundation for talent training in Colleges and universities.

***Keywords:*** *Artificial Intelligence, College Teachers, Information Teaching, Ability Improvement Strategy*

## 1 INTRODUCTION

The era of "AI" has been redefined, and the era of "AI" is also quietly coming. The new era puts forward higher requirements for the comprehensive ability of CT. In the integration with the wisdom of education, AI is deeply affecting the trend of teachers' teaching ideas, teaching modes and teaching methods. The future will be a new era of "man-machine teaching". The intelligent era requires teachers to integrate into the world of "man-machine teaching" as soon as possible. Teachers urgently need to continuously improve their TA to adapt to the development of education in the new era. Based on this, this paper studies the strategies to improve CT information-based TA in the era of AI.

Many scholars at home and abroad have studied the strategies to improve the information-based TA of CT in the era of AI. Yellapantlak has explored the use of AI in financial services; Study the role of AI in enhancing students' experience in learning activities. The research methods are mainly exploratory. The study raises some significant implications for future skills development and ethical issues that need to be considered for legislation and the drafting of public protection policies [9]. Azevichai analyzes the application mode of immersive learning technology in the practical activities of computer science teachers. On this basis, a set of computer tools and equipment are proposed to allow the introduction of immersive technology into educational practice. This paper introduces the methodological suggestions on the use of virtual, augmented and hybrid reality technology in informatics courses and after-school time [1].

Based on previous studies, this paper understands the latest development and research results of AI teaching application. Through the case analysis method, the practical cases of AI teaching application are analyzed in detail. Understand what aspects AI will change teaching, extract what teaching elements AI will affect and how it will affect. Finally, based on the previous analysis and research, this paper expounds the changes caused by AI in teaching resources and teaching environment, teaching and learning methods, teaching evaluation and teaching


B. Fox et al. (Eds.): IC-ICAIE 2022, AHCS 9, pp. 1188-1192, 2023.
https://doi.org/10.2991/978-94-6463-040-4_177

management, discusses some countermeasures for the application of AI in teaching, and how to better integrate AI into the teaching process [6] [8].

## 2 RESEARCH ON THE STRATEGY OF IMPROVING COLLEGE TEACHERS' INFORMATION-BASED TEACHING ABILITY IN THE ERA OF ARTIFICIAL INTELLIGENCE

### *2.1 Background and Connotation of AI*

AI is applied to the weighted reasoning model in Teaching: Generally speaking, the influence of each premise on the rule conclusion is different, that is, the support for the conclusion is different, and the amount of information is also different. For example, in English learning, it is also the examination of a grammar point. Different test questions have different examination degrees about this grammar point. If some test questions are done incorrectly, it can be judged that students have not mastered this grammar point. Some test questions can only judge that students have a certain degree of problems in this knowledge point.

In the process of imprecise reasoning, if there are multiple preconditions of knowledge conditions, weighting factors can be introduced to represent the importance of sub conditions. By giving different weights to different sub conditions, we can reflect the influence of each sub condition in multiple conditions on the conclusion. Generally speaking, the stronger the independence of a sub condition, or the higher its importance to the conclusion, the greater the weight of the weighting factor of the sub condition [2].

Where Xi (I = 1, 2, ... N) is the sub premise, y is the conclusion, and their true values are between [0,1]. The weighting factor VI (I = 1, 2, ... N) is the weight coefficient of the sub condition Xi. Its value must be given $\sum_{i=1}^{n} v_i = 1$ by the domain expert and meet the normalization condition. If the reliability of each sub condition Xi is CF (XI), then the reliability of the combined evidence is calculated by formula (1):

$$CF(X) = \sum_{i=1}^{n} v_i \times CF(X_i) \tag{1}$$

If the normalization condition is not satisfied, CF (x) is calculated by the following formula (2):

$$CF(X) = \sum_{i=1}^{n} v_i \times CF(A_i) / \sum_{i=1}^{n} v_i \tag{2}$$

CF (y, x) is the credibility of the rule and meets AAAA, then the credibility of conclusion y is calculated by equation (3):

$$CF(Y) = CF(Y, X) \otimes CF(X) \tag{3}$$

Where $\otimes$ is the operator, which can be multiplication, minimax, minimax, etc. The weighting factor of sub conditions is introduced into the rules, so that the English expert system can express the different support degree of multiple conditions to the conclusion and the independence and dependence of each condition, and enhance the accuracy of knowledge representation and imprecise reasoning [7].

### *2.2 Main Characteristics of AI Teaching*

Intellectualization: intellectualization is the essential feature of AI teaching. First of all, in higher education, AI emphasizes the relationship between teachers' teaching and intelligent devices. Facing the era of AI, the use frequency of intelligent devices will increase significantly. For higher education, the first is the intelligent tutor system. Intelligent tutor system is a computer system that assists teaching by imitating the experience and methods of teaching experts. CT can provide timely and personalized guidance and feedback for students through this system.

Informatization: informatization is the basic feature of AI teaching. AI cannot realize its value alone without the existence of Internet of things. The future education content will gradually become customized. From the perspective of AI, CT can use equipment to do information processing, so as to customize more targeted education methods and methods, and can apply big data and AI technology to monitor and evaluate students. Help teachers manage students through data informatization into simple language [3].

Automation: automation is the fundamental feature of AI teaching. AI can highly realize the automation level of knowledge practice in educational activities. Taking the collection of knowledge data as an example, through AI technology, college students can intelligently preprocess their knowledge information through AI technology. The analysis and understanding after knowledge collection need to describe, compare, classify, explain, evaluate and theorize the corresponding codes. This series of work can realize the automation of knowledge analysis through machines.

Collaboration: collaboration is a typical feature of AI teaching. The collaborative characteristics of AI teaching emphasize the high integration of human brain and computer brain in the process of teaching, so as to promote the development of education. In the intelligent era, innovative education and traditional teaching

develop together, and students can interact with intelligent devices to the greatest extent.

### *2.3 Strategies for Improving CT Information-Based TA*

CT intelligent information-based TA refers to the sum of knowledge, skills and literacy that teachers should have in teaching in order to adapt to the changes of the times and achieve teaching objectives under the background of AI education. Intelligent TA of CT refers to the future development ability of CT Facing the era of AI. They should have the ability of educational technology application and research, especially the ability of mining, analyzing and processing data. According to the characteristics of intelligent teaching environment from the perspective of AI and based on the above research, the constituent elements of CT intelligent TA in the era of AI are teaching design and development ability, teaching organization and management ability, teaching evaluation and reflection ability, and educational technology application and research ability, as shown in Figure 1 [5].

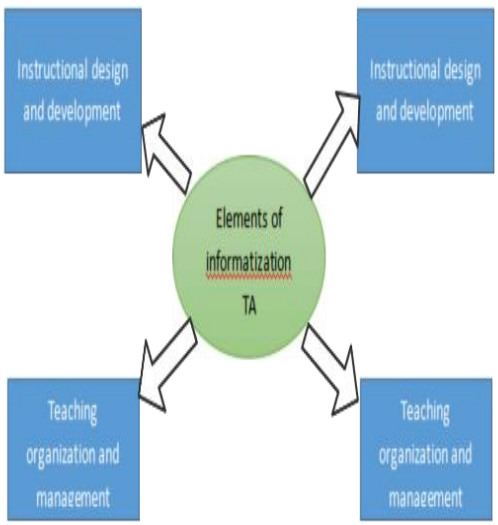


Figure 1. Elements of informatization TA

The teaching organization and development ability of CT mainly refers to the teachers' systematic and innovative comprehensive design ability of teaching content according to the basic concepts of knowledge view, learning view, student view and teaching view before teaching. The development of AI provides a new platform for education. Teachers take AI as an auxiliary teaching tool to assist teaching management, teaching test, teaching plan design and so on. Of course, AI is not omnipotent. Some work cannot be done by AI, such as emotional communication between teachers and students, heuristic teaching of teachers, and personality charm of teachers, which can not be achieved by AI technology. Therefore, teachers need to interpret and analyze the teaching content according to their own teaching philosophy, teaching style and teaching experience, Develop new research highlights of strategies to improve the teaching and learning ability of CT from the perspective of teaching AI, design excellent teaching schemes and better implement teaching.

The application of AI in classroom teaching greatly liberates teachers' repetitive work and ensures the order and efficiency of classroom teaching. The first is the intelligent monitoring of AI. The classroom is equipped with high-definition cameras. At the same time, in classroom teaching, some students will have a variety of problem behaviors, and dealing with problem behaviors well is the basic condition to ensure the normal operation of the classroom, and its treatment methods are also flexible and diverse. With the emergence of AI education, more classroom problems have been well solved [4].

## 3 INVESTIGATION METHODS OF TEACHERS' INFORMATIZATION ABILITY

The main task of this section is to use SPSS software to statistically analyze the data of 233 questionnaires collected, so as to understand the current situation and problems of CT information-based TA, and provide reference for other scholars to further carry out relevant college young teachers' information-based TA. And conduct t-test. The t-test formula used in this paper is as follows:

$$e = \frac{\overline{X} - \beta}{\frac{\delta X}{\sqrt{n}}} \tag{4}$$

$$e = \frac{\overline{X_1} - \overline{X_2}}{\sqrt{\frac{(n_1 - 1)S_1^2 + (n_2 - 1)S_2^2}{n_1 + n_2 - 2}(\frac{1}{n_1} + \frac{1}{n_2})}} \tag{5}$$

Where formula (4) is a single population test, $\bar{x}$ is the average number of samples, s is the standard deviation of samples, and N is the number of samples. Formula (5) is a double population test, $s_1^2$ and $s_2^2$ are the two sample variance, $n_1$ and $n_2$ are the sample size.

## 4 EXPERIMENTAL ANALYSIS OF CT INFORMATIZATION TA UNDER AI

There are ten items in the dimension subscale of teachers' information analysis ability. The average values are greater than 3.79, which shows that the young teachers in the tested colleges and universities have a

strong ability of information analysis. The analysis of 1-10 questions is shown in Table 1.

Table 1. Comparison of CT analytical ability

| Title number | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| mean value | 4.04 | 3.97 | 3.80 | 3.83 | 3.92 | 4.13 | 4.12 | 4.04 | 4.13 | 3.82 |
| variance | 0.583 | 0.604 | 0.672 | 0.702 | 0.713 | 0.552 | 0.575 | 0.595 | 0.560 | 0.794 |
| standard deviation | 0.763 | 0.778 | 0.821 | 0.840 | 0.844 | 0.743 | 0.756 | 0.772 | 0.746 | 0.893 |

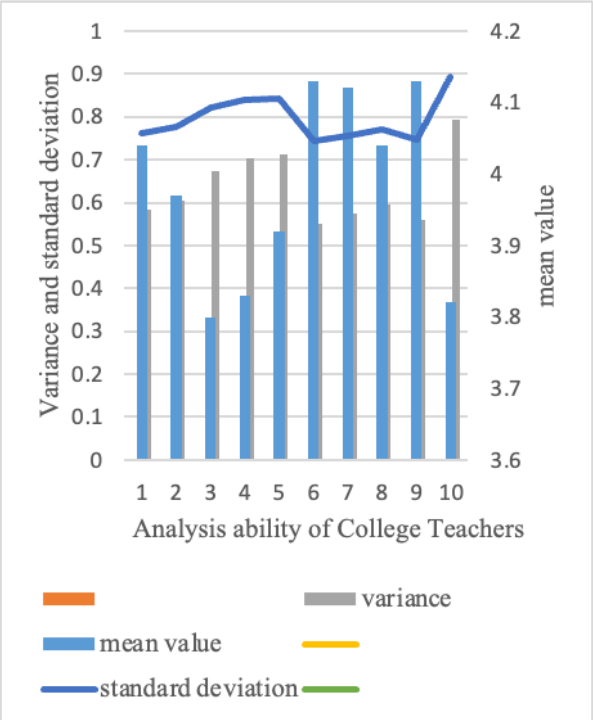


Figure 2. Analysis ability of CT

Among them, 83.26% of the tested teachers chose 5 (completely consistent) and 4 (basically consistent), indicating that most of the tested teachers have mastered the skills of analyzing the learning status and learning level of college students; In the item of "I often analyze the teaching objectives of emotional attitudes and values", 72.1% of the tested teachers chose 5 (fully consistent) and 4 (basically consistent), and 26.18% of the tested teachers chose 3 (uncertain) and 2 (basically inconsistent), with a standard deviation of 0.892. There are some differences in the degree of compliance, which indicates that some of the tested teachers are lack of ability to analyze the teaching objectives of emotional attitudes and values, It is necessary to strengthen the cultivation of teachers' ability in this regard. Generally speaking, most teachers have mastered the ability of learning demand analysis, learner analysis, teaching goal analysis and teaching content analysis, but they need to be further improved and strengthened in some aspects.

## 5 CONCLUSIONS

Based on the background of AI, this paper takes the TA of CT as the research object, deeply analyzes the data results of the teachers' TA of the surveyed colleges, and tries to find out the ways and methods to improve the TA of CT in China. This paper puts forward the strategies to improve the information-based TA of CT in the era of AI, enriches the theory of CT TA, and expands the implementation path of CT professional development. This paper investigates and analyzes the development status and influencing factors of CT TA. The survey results help to strengthen the education researchers' understanding of CT information-based TA under the modern education environment, and provide theoretical guidance for the development of CT TA from the perspective of AI.

## REFERENCES

[1] Azevich A I. Models of using immersive teaching technologies in the practical activity of a teacher of informatics [J]. RUDN Journal of Informatization in Education, 2021, 18(2):152-161.

[2] Chatterjee S, Sreenivasulu N S. Personal Data Sharing and Legal Issues of Human Rights in the Era of AI: Moderating Effect of Government Regulation [J]. International Journal of Electronic Government Research, 2019, 15(3):21-36.

[3] Johnson A T . Ethics in the Era of AI[J]. IEEE Pulse, 2020, 11(3):44-47.

[4] Meyers H P, Smith S W. Methodological considerations for potential improvement of this study [J]. Heart (British Cardiac Society), 2019, 105 (21):1682-1682.

[5] Obschonka M, Audretsch D B. AI and big data in entrepreneurship: a new era has begun[J]. Small Business Economics, 2019, 55(3):529-539.

[6] Parisis N. Medical writing in the era of AI[J]. Medical Writing, 2019, 28(4):4-9.

[7] Satake H, Ishigaki S, Ito R, et al. Radiomics in breast MRI: current progress toward clinical application in the era of AI [J]. La radiologia medica, 2021, 127(1):39-56.

[8] Wasliyah S, Wijonarko B. An IMPROVEMENT OF ABILITY TO CARDIOPULMONAR RESUSITATION USING COMPRESSION POLKESBAN SIMULATORS OF HIGH SCHOOL STUDENTS IN TANGERANG CITY[J]. Jurnal Medikes (Media Informasi Kesehatan), 2020, 7(1):17-28.

[9] Yellapantula K, Ayachit M. Significance of Emotional Intelligence in the Era of AI: A Study on the Application of AI in Financial and Educational Services Sector[J]. Ushus - Journal of Business Management, 2019, 18(1):35-48.