



# IAST-A Model for Teaching Chinese as a Foreign Language Based on Fuzzy Neural Network Algorithm and Cloud Computing

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**Abstract.** Considering the proportion of stylistic skills in language communication, this article combines the characteristics of Chinese and needs to establish a correct positioning in teaching Chinese as a foreign language. The IAST-A (Interaction Audio-Video Share Text Activities) model constructed in this article uses social networks as a medium, and its core element is “activity”. This project requires mastering Chinese listening, speaking, reading and writing skills, but also emphasizes the ability to communicate in Chinese. The Chinese as a Foreign Language Education System based on cloud computing in this article refers to the combination of English education and English education based on cloud technology, making English education more intelligent, conducting listening teaching through cloud platforms, and conducting multi-channel interactive learning. This paper uses fuzzy neural network method to evaluate the quality of teaching, including the evaluation of teachers, students, and teaching managers. In this article, the proportion of students in the first 80–90 score range using the IAST-A model is 8.4%, while the proportion of students in the 80–90 score range after using the model is 43.5%. This reflects the effectiveness of the IAST-A model for teaching Chinese as a foreign language in this article.

**Keywords:** Teaching Chinese as a Foreign Language · IAST-A Model · Fuzzy Neural Networks · Cloud Computing

## 1 Introduction

Nowadays, in foreign language education, people’s overall understanding of language ability was vague. On the one hand, there were great differences in their cognition, and on the other hand, they did not give a reasonable answer to the problems that occurred. With the development of modern information technology, oral Chinese was widely used in the modern society. In the modern society, oral Chinese was an indispensable teaching method. The Chinese class of cloud calculation was a brand new Chinese class. It created a more realistic situation for the students in the form of sound, pictures and words, which was of great significance to improve the quality of Chinese class.

During the development of foreign language education in the past few years, the key point of it was to cultivate the language communication ability, not to teach knowledge

and theory. It opened four skill courses, namely listening, speaking, reading and writing, and adopted a more direct teaching method, as well as the concept of “Teaching more and practicing more” in the class. All these had changed from the concept of “Professor” to the concept of “ability”. Ke E’s study examined the promotion of multiple word reading for adult foreign language students in the environment of English form consciousness [1]. Yu A thought that the high drop out rate of Chinese students had always been a concern for foreign language teachers. He had discussed the theoretical foundation and meaning of Chinese characters teaching from the very beginning [2]. In order to promote remote collaboration and communication in the field of foreign language teaching, Luo H focused on five important subjects: mode, task, challenge, technology and new trend of remote collaboration [3]. At present, the teaching of English for senior students was focused on the teaching of English, which inevitably involved the problem of language strategy. It was obvious that their research did not involve this point.

This article made a detailed and comprehensive investigation and analysis of the application methods of all kinds of information technology in the current teaching of Chinese as a foreign language, which provided a solid support for the combination of information technology and the international education of Chinese. At the same time, based on the study of Chinese teaching, the problems that foreign students had to face when they were learning Chinese by voice teaching and network technology were analyzed and summarized, and tried to give some solutions to “seek advantages and avoid disadvantages”.

## **2 Inquiry Method of IAST-A Model in Teaching Chinese as a Foreign Language**

### **2.1 Teaching Chinese as Foreign Language**

With the rapid development of China’s economy, her status in the world was becoming more and more prominent. In this case, there was a “Chinese fever” in the world, which had already formed a common social phenomenon [4, 5]. Experts analyzed and said that there was a “Chinese heat” in the world, mainly because there was a huge demand for Chinese talents all over the world [6]. In addition, many advanced countries began to pay attention to studying Chinese, such as America and England. Besides, many students from other countries came to China to study every year. This further increased the worldwide enthusiasm for Chinese [7, 8]. But because of the difference between China and other countries, foreign students encountered many difficulties in learning Chinese, mainly listening, speaking, reading and writing [9].

With the continuous development of the Chinese class technology, the teacher’s demand for teaching resources is also increasing. Although there are many websites of the University and corresponding data has been established for the Chinese class resources, there is no corresponding data for a specific type of class and its corresponding teachers [10, 11]. At the same time, the current teaching resources have a large number, a variety of, scattered memory and other characteristics, which has brought a lot of difficulties to teachers’ search and use [12]. In some areas, there was an urgent problem to be solved, that was, how to use modern information technology like network and media, and how

to provide a high-quality multimedia teaching resource library for the current spoken Chinese education, and how to establish a continuous and updated multimedia teaching resource system.

## 2.2 Comprehensive Evaluation of Foreign Language Based on the Fuzzy Nerve Network

In this paper, a method based on fuzzy neural network is proposed for the quality of foreign Chinese teaching. The construction of the evaluation model of the blurry nerve network was a math tool to make a comprehensive decision with the help of the blurry line transformation and the blurry reflection, which could effectively solve the problems in the current teaching quality evaluation system of the school. Classroom teaching relied on the exchange of information between teachers and students. With its own dynamic, multiple factors, slow effect and blurry characteristics, the traditional teaching quality assessment was facing some difficulties.

To confirm the set  $Y_S$  of factors for teaching Chinese as a foreign language:

$$Y_S = (U_1, U_2, \dots, U_n) \quad (1)$$

$P_J$  for the assessment of foreign language teaching:

$$P_J = (V_1, V_2, \dots, V_m) \quad (2)$$

To make sure if she succeeded in learning Chinese, the root mean deviation  $R_C$  was:

$$R_C = \sqrt{\sum (T_p - O_p) / n_p} \quad (3)$$

## 3 Construction of IAST-A Model for Teaching Chinese as Foreign Language

### 3.1 Design of the Foreign Language Teaching System

With the rapid development of internet technology, online education has increasingly become a mainstream learning mode. To better adapt to this internet trend, cloud computing technology has become an important technical support. Based on cloud computing technology, we have developed an efficient and convenient Chinese teaching system for foreign students. The system is primarily designed to improve teaching efficiency and students' learning outcomes, while also providing students with more learning options.

The cloud-based system facilitates online Chinese language teaching for students via various devices. It comprises several modules: the Student Information Module records basic student data and tracks progress; the Learning Resources Module offers diverse materials for language learning; the Teaching Information Module provides teaching schedules and content; the Live Teaching Module delivers online courseware and videos, including advanced scenario simulations; the Testing Module assesses students' language proficiency; the Learning Report Module generates personalized reports

to guide learning strategies; the Extended Learning Module enriches the learning experience with cultural content; and the Communication and Discussion Module encourages interaction among students and teachers. This system enhances the efficiency and quality of Chinese language learning by offering rich, personalized, and diverse resources and methods.

### 3.2 Construction of IAST-A Model

The IAST-A model is a Chinese language teaching model based on social networks. The model mainly promotes students' Chinese language abilities through activities. In this model, social networks are a key media element, and students can participate in learning activities through social network platforms to experience and learn Chinese language knowledge and skills. Of course, the design and implementation of the IAST-A model need to consider students' personalized requirements, so it has strong flexibility and customizability. In daily life and usage, the application scope of this model is also very wide, not only suitable for traditional teaching modes but also can be widely used in online education and blended education.

## 4 Construction of IAST-A Model

The teacher used the multimedia teaching materials to focus on teaching, and the teaching was based on the book. Only by an objective understanding of the book could they better discover and create new books. Therefore, before the design of the spoken Chinese teaching, the assessment of the spoken Chinese books used by the current teachers was carried out a survey, and the results were as shown in Table 1.

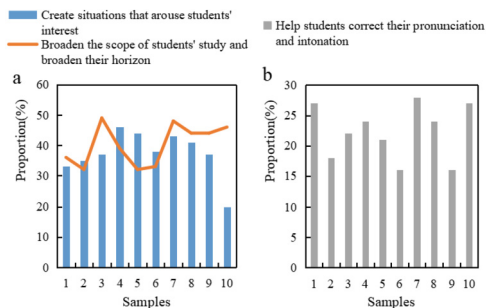
The purpose of spoken English textbooks was to cultivate students' ability to use Chinese correctly and take the initiative to communicate. It should have a strong communication nature, and its content should meet the needs of students in real life. However, according to the investigation, 65% of teachers thought that the current spoken English textbooks lacked real language materials. From this point, it could be seen that the English teacher had different evaluation of the current spoken English textbooks. However, most of the teachers thought that it was necessary to use the teaching resources of cloud advertising. If they only relied on the knowledge in the book, they couldn't meet the needs of students. Therefore, when the teachers were preparing the course, they had to add some expanding materials related to spoken Chinese and many kinds of media materials related to the course content, only in this way could they adapt to the needs of students of different levels. Therefore, he set up a resource library of cloud advertising that matched the teaching material, so that it could better provide the teaching materials for the teachers.

The teacher's approval of the use of the foreign language teaching system was shown in Fig. 1 (creating a scene to arouse the students' interest, expand their learning scope and broaden their horizons). But it can help students correct their pronunciation and tone as shown in Fig. 1 (b). In Chinese class, the teachers agreed with the positive effect of the multimedia teaching resources. Among them, the choices of creating a scene to arouse students' interest occupied 74%; the choices of expanding students' learning

**Table 1.** Evaluation of the Chinese textbooks used by the teachers

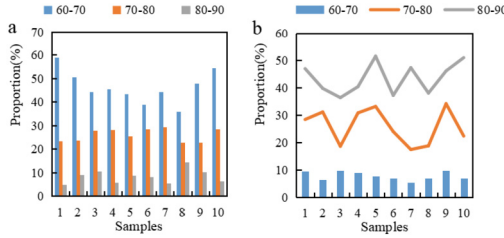
Identification situation	Lack of authentic language materials (%)	Have an impact on students' actual oral communication ability (%)	Cloud Computing is necessary for teaching (%)
Agree	40	15	50
Comparative agreement	25	20	20
Disagree	15	25	15
Unclear	20	40	15

range and broaden their horizons occupied 62%; the choices of helping students correct their pronunciation and tone occupied 51%. It could also be seen that if the foreign language teaching system was applied to the spoken Chinese, it could indeed attract the students from many aspects and angles, so that the spoken Chinese class would be closer to the real life. Through the personal experience, the students could cultivate their understanding of the language communication ability.

**Fig. 1.** The teacher's approval of the use of the foreign language teaching system

On this basis, it was necessary to have a preliminary discussion about the interaction teaching mode and its use in the online spoken Chinese class. Based on this situation, it was obvious superiority to combine the characteristics of the spoken English course with the local characteristics. However, because of the lack of interaction in class, there were still some problems in the application of this mode. Therefore, this paper planned to integrate this mode into the Chinese teaching, and design a foreign language teaching course based on interaction, in order to learn Chinese on the Internet.

The comparison of students' scores before and after the IAST-A model was shown in Fig. 2. The former was shown in Fig. 2(a), and the latter was shown in Fig. 2(b). The ratio of students in the top 80–90 scores of the IAST-A model was 8.4%, and the ratio of students in the top 80–90 scores of the IAST-A model was 43.5%.



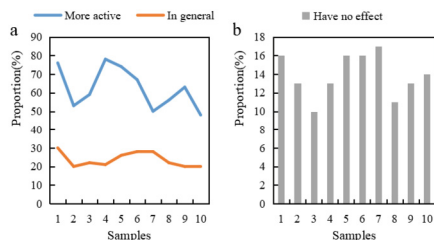
**Fig. 2.** Comparison of students' scores before and after using the IAST-A model for teaching Chinese as a foreign language

IAST-A teaching model was a two-way interaction process, so teachers should propose some inspiring questions and give guidance to students, so that they could actively participate in the class and increase their frequency of speaking. In the teaching of spoken Chinese, the teacher was the leader and the student was the main body. If students could stimulate their enthusiasm to participate in the class and improve their motivation of learning.

With the rapid development of China and the enhancement of national strength, the development of internationalization of Chinese language has increasingly influenced the world, and has also stimulated many people's enthusiasm for learning Chinese as a foreign language. In this era of rapid technological development, and there are many online teaching websites and various learning platforms. The rise of online education platforms not only provides a good learning environment for Chinese learners, but also achieves teaching effects that traditional Chinese education cannot achieve through various forms.

The level of teacher performance in a foreign language classroom is directly related to students' language interaction ability. The main reasons for this are: First, in the process of teacher-student interaction, students may ask questions that are not related to the classroom content, disrupting the pace of class and slowing down teaching, making it difficult for teachers to control the pace of class; The second reason is that teachers and students are located in two separate spaces, and teachers cannot monitor and manage the classroom in real time. Instead, they need to use devices such as mobile phones and microphones to monitor the classroom. Third, attention to students has become distracted. The above problems can cause difficulties for teachers to control the classroom, thereby affecting the interaction between students. Although in the teaching process, various types of interaction can be used to attract students' attention. However, if students' focus is not within the scope of the course content, it is difficult to achieve true interactive effects.

After using the IAST-A model, students' enthusiasm for learning Chinese is shown in Fig. 3 (relatively positive and general, as shown in Fig. 3(a), with no effect, as shown in Fig. 3(b)). The proportion considered to be relatively positive was 62.4%. The rate of no effect was only 13.9%.



**Fig. 3.** Students' enthusiasm for learning Chinese after adopting the IAST-A model

## 5 Conclusions

This article briefly reviews the emerging “cloud” technology in recent years, compares the application and popularity of fuzzy neural networks and cloud computing in other fields, explores new ideas for the cloud computing and Chinese language education, and gives reasonable design assumptions based on this. This article also proposes countermeasures to “seek advantages and avoid disadvantages” in order to better use cloud computing technology for teaching Chinese as a foreign language. At the same time, this paper briefly reviews the two new technologies, “cloud computing” and “fuzzy neural network”, which have emerged in recent years, as well as their application and popularization in other fields, explores the integration approaches of new technologies and Chinese language teaching, and proposes corresponding design schemes. This article analyzes and summarizes some theories and examples used in a large number of literature searches in order to make a more comprehensive and correct discussion of this issue.

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