Design and Construction of College English Translation Auxiliary Teaching System Based on Python Language

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Abstract. Faced with many difficulties in cultivating English translation talents, colleges and universities should adhere to the drive of innovation, build a new ecology of English translation teaching in colleges and universities with the help of information technology under the environment of "Internet + education", and realize the deepening reform of traditional teaching mode. In this regard, this paper will study a set of construction scheme of college English translation auxiliary teaching system, which will provide reference for the innovation of English translation teaching. The system belongs to B/S architecture, the front-end interactive interface is designed and developed with VUE framework as the core, and the back-end Web Server is built with Django framework, and Mysql database is used as the system support. The function setting of the system will fully cover the needs of English translation teaching, and realize the digital and information transformation of teaching activities with diversified data and information interaction. Especially in teaching evaluation, the system will automatically complete the evaluation of learning effect with the help of decision tree (C4.5) model algorithm, which improves the applicability and scientificity of the auxiliary teaching system. The measured results show that the construction of auxiliary teaching system is of positive significance to improve the effectiveness of English translation teaching.

Keywords: English translation · network teaching · Python · B/S architecture · computer application

1 Introduction

At present, under the new situation of economic globalization, the cultivation of English translators is closely linked with international affairs. The goal of talent cultivation is no longer to focus solely on interpretation and translation ability, but also to take into account the improvement of comprehensive qualities such as ideological and political, human history, international vision and feelings of home and country [1]. However, in the English teaching system of many universities, translation course is not a core course. Influenced by the concept of exam-oriented education, English teaching practice in colleges and universities still focuses on traditional listening, speaking, reading and writing. Translation courses are often set as elective courses or ignored directly, and the

school pays insufficient attention to them. In addition, the opening of translation courses is mostly confined to the traditional teaching mode, lacking teaching innovation, outdated content, fixed form and rigid thinking, which limit the improvement of teaching effect and quality [2]. In view of this, this paper holds that colleges and universities should actively grasp the concept of cultivating English translation talents at this stage, adhere to the drive of innovation, and build a Web-based college English translation auxiliary teaching system with the help of the practical characteristics of network information technology, database management technology and computer application technology, and strive to deepen the reform of traditional teaching mode in the environment of "Internet + education" [3].

2   Development Process

First, for the construction of the university English translation auxiliary teaching system Web Server, the bottom operating system is Windows 10.0 x86-64bit, the development language is Python 3.8, the integrated development tool is Pycharm 2019, and the database server is Mysql 5.7.31 [4]. In Python language environment, a special Web Server Gateway Interface (WSGI) interface protocol is needed between Django framework and Web server to realize data communication [5]. As far as this system is concerned, the logic running on the Web Server side is Nginx-WSGI-Django. After the installation of the above software, you can directly select Django and create an independent virtual environment when creating new items in Pycharm. At the same time, the basic directory of the project will be set up, mainly including Manage.py, Urls.py, wsgi.py and Settings.py [6].

Secondly, the front-end interactive interface of college English translation auxiliary teaching system will be developed with VUE framework as the core [7]. After the front-end page design is completed, copy and import the code and files of the front-end page into the file directory in Django application. Other functions in the system can be developed according to the requirements. After the functional modules are designed, all the files are packaged and published on the server, which is convenient for users to log in and visit remotely. Through the introduction of the above key technical theories, the overall environment of system development, the configuration of related software and tools are determined, and the technical feasibility of the overall project of college English translation auxiliary teaching system is also clarified.

3   Functional Implementation

3.1   Student End

a. Online online learning
The course content setting in the auxiliary teaching system is no longer a copy of the teaching material content, but more targeted and interesting, such as Interpretation Shorthand, Translation of Contemporary Chinese and Dialect Translation. In addition, the

system also brings excellent extracurricular teaching resources in traditional culture, ideology and morality into the curriculum system, which can guide students to strengthen their ideals and beliefs, cultivate patriotic feelings and strengthen personal moral cultivation while learning professional knowledge and ability, and truly promote students' personalized and all-round development [8].

b. Simulation test and training

Under this functional module, the auxiliary teaching system will enrich and innovate the teaching form. The simulation test subsystem is preset in the system, which collects all kinds of questions contained in the English translation and English interpretation professional qualification examination into a question bank, so that students can conduct online simulation tests conveniently. In addition, the system will also provide various types of situational and case-based virtual scenes, such as combining tourism, foreign affairs, business, law and other directions, which effectively enhances the authenticity and practicality of translation training and urges students to master English translation skills quickly [9].

3.2 Teacher End

The function setting of teachers' end is different from that of students' end, and it focuses on the organization, management and maintenance of systematic courses.

Among them, the evaluation function module is the core function of the teacher, which aims to solve the problem of difficult implementation of the process evaluation of online teaching. Through the collection and storage of the data used by the student user system, combined with the corresponding evaluation standards, the assessment and scoring of learning effect are automatically completed. Table 1 shows the evaluation index of online learning effect and related test data.

According to the data distribution, the system sets the corresponding evaluation criteria to discretize the continuous data, and collects the evaluation indicators as the combination of independent variables, and the dependent variables are composed of three values of "high, medium and low" to form a classification judgment model [10]. Each evaluation index obtains the gain of index attribute through information quantity and information entropy. As shown in Formula 1, Formula 2 and Formula 3, there are formulas for calculating information quantity, information entropy and information gain. Where N is the total number of samples, and m and k are the number of discretized data. Finally, analyze and compare the information gain of each index, determine the decision tree model, and finally get the evaluation result of learning effect through the operation of C4.5 algorithm.

$$Info(M) = -\sum_{i}^{n} \frac{m_i}{N} \times \log_2 \frac{m_i}{N} \tag{1}$$

$$Info(K) = \frac{N'}{N} \times \left[-\sum_{i}^{n'} \frac{k_i}{N'} \times \log_2 \frac{k_i}{N'} \right] + \frac{N - N'}{N} \times \left[-\sum_{i}^{n-n'} \frac{k_i}{N - N'} \times \log_2 \frac{k_i}{N - N'} \right] \tag{2}$$

$$Gain(K) = Info(M) - Info(K) \tag{3}$$

Table 1. Attribute information table of learning effect evaluation indicators

Evaluating indicator	Indicator observation value	Minimum	Maximum	Average value	Standard deviation
System usage time	Field Time, long int, continuous value	28.37	54.51	39.63	5.07
Study duration	Field Time, long int, continuous value	22.10	50.03	36.57	5.54
Course completion degree	Field Properties, String, excellent, good and poor	1	3	2.03	0.55
Training times	Field Hits, int, continuous value	8	44	25.23	6.11
Test results	Field Grade, varchar, continuous value	51.64	87.69	73.65	7.43

Table 2. System test data results

Learning effect	Total number of samples	Original excellent sample number	Original good sample number	Original poor sample number	Correct number of classification
Excellent	2570	2316	207	47	90.03%
Good	3461	223	3012	226	86.96%
Poor	887	16	53	818	85.14%
Total	6918	2555	3272	1091	87.37%

After testing, the computing time of C4.5 algorithm in 6918 data training sets is 73 s, and the classification accuracy rate reaches 87.37%. The detailed test results are shown in Table 2.

4   Conclusion

In order to improve the effectiveness of English translation teaching in colleges and universities, this paper aims at many problems in the teaching mode, and builds a Web-based college English translation auxiliary teaching system with the help of the practical characteristics of network information technology, database technology and computer application technology. The system realizes the digital and informational transformation of teaching activities with diversified data information interaction, and can be combined

with classroom teaching to form a new ecology of English translation teaching in colleges and universities, making an attempt for the modernization and intelligent construction of higher education.

References

1. Wang Xiaoli. Research on the Cultivation of College English Translators under the Background of Economic Globalization [J]. English on Campus. 2021.06.
2. Ye Lei, Liu Ping. Research on the Training of Applied Translators in Local Universities from the Perspective of New Liberal Arts [J]. Journal of Higher Education. 2021.08.
3. Du Kehan. Discussion on the Teaching Mode of College English Translation under the Background of Internet Plus [J]. Northern Lights. 2019.01.
4. Bai Changsheng. Python Web Development Based on Django [J]. Information and Computer (Theory Edition). 2019.12.
5. Wei Limei, Su Bing. Overview of Python Website Development Process under Django Framework [J]. Computer & Telecommunication. 2019.12.
6. Qiu Hongli, Zhang Shuya. Research on Web Project Development Based on Django Framework [J]. Scientific and Technological Innovation. 2021.09.
7. Liu Yaru, Zhang Jun. Research on Vue.js Framework in Website Front-end Development [J]. Computer Programming Skills & Maintenance. 2022.01.
8. Wang Liyan. Reflections on the Teaching Mode of College English Translation under the Network Environment [J]. Education Modernization. 2019.06.
9. Wang Xinxin. Discussion on Teaching Strategies of College English Translation Based on Situational Cognitive Theory [J]. University. 2021.07.
10. Liu Zhilong, Li Bing, et al. Research on the Application of Teaching Effect Evaluation Based on Online Learning Space [J]. Wireless Internet Technology. 2019.08.