Research on Model Selection and Methods of Business English Software Systems Based on Grey Relational Analysis

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Abstract

With the rapid development of modern information technology, it has brought a broader space for all areas of society, providing new development opportunities. By virtue of the advantages of advanced technology, it helps improve the working efficiency and change the people's lifestyle and ideas. For the business English teaching, due to its strong professional discipline, it involves a wide range of knowledge and its theoretical content is more stringent. In the current context, modern technology has pointed out the direction for teaching reform and the traditional teaching model has been unable to meet the needs of cultivating business English professionals in today's market. The full implementation of teaching innovation and the full realization of modern software system teaching are imperative for business English, which are the inevitable choices to promote their own further development. However, due to the current market, there are many companies engaged in the business English software system production, presenting many uncertainties when colleges making the choices. Therefore, based on the Grey relational analysis, it designs the selection model of business English language software system, and the specific implementation of a detailed study to help choose the most suitable software system for business English, so as to improve the quality of personnel training and to promote the sustainable development of business English education.

Keywords, Grey Relational Analysis, Business English, System Selection and Architecture Model.

1. RESEARCH BACKGROUND

1.1 Literature Review

Generally the competency-based educational models are practiced in the international education in vocational colleges (such as North America's curriculum models of CBE and DACUM). With these models, the competency standard comes from the analysis of the job assignment very similar to the job position. Hence a course is developed for each specific capacity (Xiao, 2008). But this only applies to the training of simple technical ability. That's why China has failed in introducing it into vocational education. The National Qualification Framework and Training Package for Vocational Education launched in Australia, focuses on the development of integrated vocational competencies rather than individual competency. It aims to convert the competency standards into curriculum objectives, helping with the implementation of the curriculum design as a guide to the practice of planning, development and operation of the training. It will become the basic model of vocational education. Germany, at the end of the 20th century, placed the work process-oriented as the guide in the construction of systematic curriculum of the process of the dual system (Ran, 2014). These two models of Australia and Germany represent the advanced level of curriculum development of contemporary education.

But with the continuous progress of science and technology, the developed countries began to introduce the modern teaching technology on the basis of the original teaching curriculum, integrating it with the traditional teaching and completely changing the teaching mode. Especially in recent years, the development and application of major teaching software systems has brought new experiences for the education and teaching. It not only improves the teaching efficiency, but also strengthens the students' professional skills (Li, 2016). In this regard, China's business English education is also actively learning from foreign advanced educational philosophy and modern education model. But there are still many deficiencies in the choice of business English software systems. It cannot ensure that the final choice of the system can really meet its own actual needs. Thus it needs to carry out an in-depth study of business English software system selection, and to come up with an effective solution to this problem.
1.2 Research Purpose

The development and application of business English software systems is of great significance to the education and teaching of business English. The system boasts of rich content and with special training module where students can learn, the teacher correction work module, teacher and student interaction module, and the test module where students can have test. At the same time, the teachers can also use the management function to timely grasp the student's learning situation (Huang, 2016). Business English software system allows students to fully grasp the basic business knowledge in the field of international business, international management and related business processes, developing students' business awareness, strengthening their business English skills with in-depth understanding and cognition of the business etiquette. In addition, it can help teachers to better develop the language application ability of the business English majors, and it can carry out the detailed tasks of the business work independently, so as to cultivate the versatile business English talents with professional sustainable development. It can be seen that the status of the software system in business English teaching also shows the importance of the choice of the software systems (Zheng, 2016). Therefore, this paper makes full use of Grey relational analysis method, with a comparative analysis of a variety of business English software systems, use the calculation and evaluation of the model. Finally it chooses the best and the most suitable business English software system.

2. OVERVIEW OF BUSINESS ENGLISH SOFTWARE SYSTEM

2.1 Background of System Development

In recent years, China's higher education has been fully into the popularization stage. Higher education has shifted from the originally research type to the new application-oriented education. So the structure of English professional personnel training also changes into the cultivation of versatile talents. Business English teaching belongs to the category of applied linguistics, advocating learning + training + practice in the course curriculum. But in practical teaching, it is difficult to carry out the training course, and the best form only stops in the construction ideas of training base of the teachers. In the time of real implementation, it poses great restrictions in terms of the venue and hardware facilities. Such a practice base requires a lot of money invested by the colleges (Zhang, 2016). At present, the opening of business English is mostly set up in foreign language institutions. The colleges have relatively vague ideas about the relation between business and English. Some institutions have launched business courses by school of business, the language courses provided by school of foreign languages. There are many course curriculum designed by foreign language teachers independently. But the software system is the training environment based on the English language, with the detailed working scope of the every job position of the industry as the main line. It strives to cultivate the English language skills, business expertise, business practice skills of the business English students. Therefore, every teaching model can be generally applied in the software system.

2.2 System Structure

Business English training platform aims to provide the entire practice environment of the simulation of the current international business for students. The software fully reflects a variety of different roles including import and export trading companies, financial institutions, insurance companies, Customs, State Administration of Foreign Exchange and foreign transport enterprises of the whole process of business activities (Wu, 2016). The students in the system can simulate the import and export companies to conduct international trade transactions, and continuously enhance their trading capacities, to understand the signing of the contract, different registration of business in Shenzhen, invoice issuance, cargo consignment, merchandise insurance, storage and other business links. At the same time, the Business English software system enables teachers to complete their practical teaching tasks quickly and fully cultivates the students according to the detailed requirements of the enterprise. Students can fully practice in different fields. This platform is to strengthen the students' English language skills, learning skills of business expertise, practical business skills, with particular emphasis on training students’ practical ability, communication skills, application skills and professional ability (Qian et al., 2016). The specific structure of the software system is shown in Figure 1.
3. COMPOSITION OF TEACHING SYSTEM OF BUSINESS ENGLISH SOFTWARE SYSTEM

3.1 The design of business English training teaching system should be based on the market survey and the main characteristics of students, in accordance with the characteristics of vocational education and professional values and the curriculum concept of professional work process. The professional teaching system of vocational education should be based on a sub-student career capacity. It should develop the courses based on the analysis of the requirements of the future professional job and design the courses according to the working process of specific jobs (Zhang and Guo, 2014). Secondly, it needs consider the actual needs of the market and the overall characteristics of students, to build the actual training system, with a ladder Business English training system project of the establishment of emotional cognitive training, simulation of scenario training, simulation of software system training, school virtual electronic backstage training, entity enterprise training slabs. In addition, according to the various aspects of the work, the system will be subdivided into the training projects based on the working process. The training of various projects will be carefully planned to build a student-oriented, scenario-building, students’ cooperation, exchange and other constructive leaning t model, based on constructivism learning theory and cognitive linguistics theory. The final perfect formation of the system includes training objectives, training time, place, subject, preparation, operation details, guidance and the like. The design framework of business English training system is shown in Figure 2.
3.2 Ladder Business English Training System Project

According to the design and construction of the business English teaching and training system in Figure 2, on the basis of it, the training project is planned and formulated in details. The implementation of all projects should be fully compliant with the main characteristics of students and the actual needs. According to the relevant scholars’ points of view, in normal circumstances, the main objectives of vocational education are with the characteristics of vivid thinking (Mu, 2015). Teaching practice and scientific research can effectively verify such idea that the people of strong image thinking can get more empirical and strategic aspects of knowledge while resenting the descriptive knowledge. In other words, they are good at solving the problems of "how to do it" and "how to do it better". The training system of business English divides the experience acquisition process into five links, from the cognition of the image to the actual work scene, satisfying the students' needs and characteristics (Dong and Xia, 2013). The training courses are divided in accordance with the ladder-type stratification, namely the professional cognitive layer, including the field observation, knowledge lectures and career planning which can help students get specific sensory awareness; the simulation scenario training, including the planning of future working scenarios, the actual simulation training; software simulation of the business process layer where students can merge into a more realistic simulation of scenario training to master the basic skills of the subject; the on-campus virtual electronic backstage operation which can provide more professional virtual services or network services for the enterprises; the enterprise internship which can help the students to engage in the real business internship instead of limiting themselves in the scenario training, where they could use the knowledge learned to the actual work and ready for the real work performance any minute. The specific design is shown in Figure 3.

![Figure 3. Ladder Business English Training System Project](image_url)

3.3 Specific Application of Business English Software System

First of all, business English students can have pre-class preview guide, in-class practice test, information query and after-school discussion questions through the platform. In the preview phase, students can use the client end to understand the general contents of the classroom, and even watch to record teaching video made by the teacher in advance. In the classroom, teachers can arrange group discussions and classroom exercises through the platform. The platform will automatically calculate the current practice, and then the teacher will explain the contents with strong sense of purpose (Wang, 2010). The after-school exercises play a supervisory role. Secondly, in terms of the effect, the virtual simulation platform of business English can realize the efficient management of experimental teaching resources and realize the sharing of experimental teaching resources within and outside the school, the region and the limited-areas, to meet the needs of multi-regional, multi-school and multi-disciplinary virtual simulation of experiment teaching. Finally, the virtual simulation experiment platform of business English can integrate all the experimental teaching software into one unified access and one unified purpose of experiment for the students in the platform through the seamless connection between systems, in order to achieve holistic experimental results (Tian, 2010). Through the deployment of the platform, it can...
improve the system coupling and solve the problem of Information Island. Also it can make the virtual simulation experimental center to quickly use a third-party experimental teaching software. The management and sharing platform of the open virtual simulation experiment teaching, including virtual experiment center portal, experimental educational administration management, experimental teaching management, pre-experimental theoretical knowledge learning, intelligent guidance of experimental process, automatic correction of experimental results, experimental report management, management of experimental teaching resources, management of open laboratory appointment, interactive communication and system management and other functions(Zhang, 2005). It uses information technology and virtual simulation experiments to develop software, and constantly builds and integrates information experimental teaching resources, to build an open, interactive and intelligent virtual simulation experimental teaching platform. Through the network and social sharing of the virtual simulation experimental teaching resources, it further plays the role of demonstration and radiation in the area of business English experimental teaching.

4. MODEL SELECTION OF BUSINESS ENGLISH SOFTWARE SYSTEMS BASED ON GREY RELATIONAL ARCHITECTURE

4.1 Concept of Grey Relational Analysis

Grey relational analysis method is the basis of the Grey theory proposed by Professor Deng Jvlong, a famous Chinese scholar. It is a method of measuring the degrees of the relations between the scattered order materials. He said that in the objective world, the relations between many factors are "Grey", which cannot bedistinguished as more close or loose even none. The traditional methods cannot work when dealing with such problems especially with the insufficient and unclear subject matters (Pang and Chen, 2006). Grey relational analysis is aimed to deal with such scattering and uncertain data with analysis, quantitative study and sequence design from different angles, in order to clarify such relations when it comes to the certain relation or correlation between the categories, boundaries, the main content and the marginal contents and the like.

4.2 Calculation Steps

First, it establishes the original sequence. The Grey relation space is written as \{P(X);T\}, and the original sequence is written as \(X_i(1), x_i(2), ..., x_i(n)\) \(\in X\), among them \(i=0,1,2, ..., X\), and \(X_i\) is generally named as the sub-sequence. When standardizing the original sequence, it uses as the number value of the standardized sequence \(x_0(g)\) as the denominator, the relative data of each sequence is divided by \(x_0(g)\), and the function is written as \(x_i(g) = \frac{x_i(j)}{x_0(g)}\), among which, \(i=1,2,...,N\) and \(x_0(g)\) is used as the average value of the reference sequence. The comparing sequence data will be divided by the relative data of each reference sequence, and the function is written as \(x_i(g) = \frac{x_i(j)}{x_0(g)}\), among which, \(i=1,2,...,N\), and \(x_0(g)\) is the reference sequence. The average value of every feature of the sub-sequence \(x(g)\) is used as the denominator, the relative of the original sequence is divided by the average value of every feature of the sub-sequence \(x(g)\), and the function is written as \(x_i(g) = \frac{x_i(j)}{x(g)}\) among which, \(i=1,2,...,N\). The value comes from that the original data minus the average value of every feature of the sub-sequence is divided by the standard deviation of every feature of the sub-sequence, and the function is written as \(x_i(g) = \frac{x_i(j)-x(g)}{\sigma_i(g)}\), among which, \(i=1,2,...,N\).

The functions and symbols of the four pre-solutions are as follows. \(x_i(g)\) is for every original data; \(\bar{x}(g)\) is for the average value of the same feature of the sub-sequence; \(\sigma_i(g)\) is for the standard deviation of the same feature of the sub-sequence; \(x_i(g)\) is for the results out of the standardization of the original data.

Secondly, based on the calculation results from the standardization of the original data, it evaluates the results to choose the most suitable software. It establishes the standardized matrix. And every element of the matrix \(x_{ij}\) and the standardized decision matrix \(S\) can be obtained through the following two functions,

\[
x_{ij} = \frac{y_{ij}}{\sqrt{\sum_{i=1}^{n} v^2_{ij}}} \\
\]

\(i,j=1,2,...,m\), among which \(x_{ij}\) is the value of Number \(j\) feature of the Number \(i\) evaluated scheme.
It multiplies the weight and the matrix to obtain the standardized weighted matrix, and the function is written as

\[
W = \begin{bmatrix}
  w_{11} & w_{12} & \ldots & w_{1n} \\
  w_{21} & w_{22} & \ldots & w_{2n} \\
  \vdots & \vdots & \ddots & \vdots \\
  w_{m1} & w_{m2} & \ldots & w_{mn}
\end{bmatrix}
\begin{bmatrix}
  q_1 s_{11} & q_2 s_{12} & \ldots & q_n s_{1n} \\
  q_1 s_{21} & q_2 s_{22} & \ldots & q_n s_{2n} \\
  \vdots & \vdots & \ddots & \vdots \\
  q_1 s_{m1} & q_2 s_{m2} & \ldots & q_n s_{mn}
\end{bmatrix}
\]

among which \(\sum_{i=1}^{n} q_i = 1\).

It chooses the positive ideal solution and the negative ideal solution:

\[
C = \left\{ \max_{vij} \left| j \in J^+ \right|, \left( \min_{vij} \left| j \in J^- \right| \right) \right\} \quad i = 1, 2, \ldots, m
\]

\[
D = \left\{ \min_{vij} \left| j \in J^+ \right|, \left( \max_{vij} \left| j \in J^- \right| \right) \right\} \quad i = 1, 2, \ldots, m
\]

Among which, \(J^+ = \{ j = 1, 2, \ldots, n \mid j \}\) is for the benefit index, with the maximum value.

\(J^- = \{ j = 1, 2, \ldots, n \mid j \}\) is for the cost index, with the minimum value.

Then it calculates the distance between the positive ideal solution and the negative ideal solution of the Number i scheme. The distance function between each scheme and the positive ideal solution is,

\[
R^+_i = \sqrt{\sum_{j=1}^{n} (q_{ij} - q^+_j)^2} \quad i = 1, 2, \ldots, m
\]

The distance function between each scheme and the negative ideal solution is:

\[
R^-_i = \sqrt{\sum_{j=1}^{n} (q_{ij} - q^-_j)^2} \quad i = 1, 2, \ldots, m
\]

Finally, the relative affinity between each scheme and the positive ideal solution is:

\[
f'_i = \frac{R^-_i}{\tau_i + \tau'_i} \quad 0 < f'_i < 1, i = 1, 2, \ldots, m
\]

It obtains a sequence of the selected business English software systems according to their relative affinities. The greatest affinity suggests the best overall comprehensive performance of the system while the least affinity suggests the worst overall comprehensive performance of the system.

5. CONCLUSIONS

In the era of "Internet +", the virtual simulation experiment platform is centered on teaching, which integrates all the resources of the whole teaching process so that students can complete their studies more systematically and
more efficiently. The advantages of the Internet can quickly integrate into the teaching resources of the other institutions, reflecting the efficiency of the virtual simulation experiment center. The Grey relational analysis method has a great effect on the software selection. Its evaluation and analysis of the comprehensive performance of the specific products can make effective, objective and scientific analysis, which can provide the very favorable reference of the decision-makers. For example, the use of Grey relational analysis and TOPSIS model with the auxiliary assessment can provide a series of the calculation of Grey data combination model, which is more accurate and more efficient than the application of a single model. It plays an important role in the selection of software system in business English teaching, and thus provides the guarantee conditions for the smooth development of business English teaching and training. It promotes the further development of its teaching practice and improves the students' professional abilities and comprehensive qualities.

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