The Development and Construction of Automatic English Writing Evaluation System—From the Perspective of Functional Grammar

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Abstract

Functional grammar has great importance to English writing, especially in discourse analysis, mode of discourse and tenor of discourse. It can help students explore their potential ability in language use, stimulate their creativity, and finally improve their ability to use English. Playing a same role with functional grammar, automatic English writing evaluation system will evaluate and give suggestions on students’ writing and their potential development ability. Therefore, take functional grammar as the basis of the development of the automatic evaluation system can both enhance the efficiency of the system and students' English writing ability effectively.

Key words: Functional Grammar, English Writing, Automatic Evaluation System.

1. INTRODUCTION

As society develops, computers and networks are used everywhere, as well as automatic evaluation systems. It is a new technology revolution for language learning, which can effectively improve students' English ability. But it is not difficult to find out that different automatic evaluation systems have their own problems. Most of them can only evaluate according to the data entered in advance, the overall content students want to express and their logical thinking cannot be observed efficiently. Therefore, it is necessary for educators to perfect and supplement such automatic evaluation systems.

2. LITERATURE REVIEW

The application of English auxiliary teaching system has a long history. In recent years, many educators have tried to design the English writing evaluation systems and put them into use. Among them, Grimes (2010) has made designs on this kind of educational technology and put it into classroom use by doing detailed analysis on the computer hardware and software, and designing teaching software according to student's acceptance of computer teaching. But he found that it was more than a simple technical problem as the design of the system need combine with students' learning characteristics. This is a systematic change in teaching. Tang and Wu (2011) have summarized the design of automatic English writing evaluation system at home and abroad, and concluded that the design of such system had the same principle as teaching method. The system tried to enable the computer to read the English article written by students, but the overall effect was not optimistic, which still had a certain optimization space. The second year, Tang and Wu (2012) again put forward that the design of such system should combine with students' ability to ensure that the score was fair and accurate according to their study of the design and their experimental investigation and analysis. Li (2011) has designed and constructed the automatic English writing system on the basis of the dynamic evaluation theory, aiming to improve students' English writing ability, stimulate their autonomous learning ability and make it the theme of students' English learning activities. But Li also suggested that there werestill problems in designing the system, which would be improved and perfected after testing by practices. Yang (2013) has designed the system by focusing on the automatic writing evaluation function and teaching assistant function. It would evaluate and give suggestions on the grammar, format and words selection of students' writing. The design is a comparatively completed one in recent years, which is of great significance to improve students' writing ability. But strictly following the programming, the evaluation function of this system is too rigid, which needs to be improved.

3. BACKGROUND

The earliest automatic writing evaluation system was originated in the United States, where later the design and
research of the relevant evaluation systems are mostly carried out. The research of automatic evaluation system in China and abroad can be divided into three stages, which have different functions and impacts on students’ writing ability. With the development of society and the continuous progress of global integration, English is becoming more and more important to us. Therefore, students’ English ability will be improved effectively if the automatic English writing evaluation system is designed by combining with students’ favorite information technology.

4. THEORETICAL BASIS

The theoretical basis of the design of this system is the functional grammar theory combined with the sociological perspective. Halliday argued that the nature of the language is very important, which is the function that language needs to achieve. In other words, language is a unique form of behavior, the ultimate purpose of using language is to communicate with other people for different communication goals. Functional grammar has classified the functions of language based on the symbol system, mainly including social context and language symbols. The grammatical theory of social context function can be divided into three types: mode, field, and tenor. The linguistic symbols divide the functional grammar into three functions: discourse function, interpersonal function and concept function, symbolizing the continuity of language and the functions in registers. In addition, the structure is the most important part of discourse section of the system, which is the beginning of the discourse with lots of information, so it needs different structures to converge to make the whole discourse complete. The design of the automatic evaluation system is based on the consistency, completeness and coherence advocated in the functional grammar theory, so that the writing evaluation will be more flexible and accurate.

5. DEVELOPMENT PRINCIPLES OF AUTOMATIC ENGLISH WRITING EVALUATION SYSTEM

5.1 Process principle

Functional grammar focuses on the cohesion of discourse, and such cohesive exercises require students to accumulate over a long period of time. Therefore, the process is particularly important in the development of automatic English writing evaluation system. The system needs to focus on students’ learning process by observing and evaluating students’ learning and progress they achieved. In the automatic evaluation, students’ writing process should also be evaluated apart from their finished writing samples. The integration of the evaluation will enhance students’ ability of thinking and writing.

5.2 Development principle

The ultimate goal of the automatic English writing evaluation system is not only to evaluate students’ writing, but also to enhance their writing ability. Therefore, the development of automatic English writing evaluation system needs to identify the changes of students’ learning process and evaluate their present and future development instead of their past performances. In this way, students will clearly recognize their ability and advantages, and their potential will be fully stimulated.

5.3 Interaction principle

The automatic evaluation system will be much more interactive, so that students can conduct online group discussions and interactions. Teachers can also communicate with students online. Thus, students can participate in the evaluation process, which can effectively improve their practical and interactive ability in writing. At the same time, students can be promoted to adjust their learning methods consciously to enhance their English writing ability.

6. ANALYSIS OF THE DESIGN AND DEVELOPMENT OF THE AUTOMATIC ENGLISH WRITING EVALUATION SYSTEM BASED ON THE FUNCTIONAL GRAMMAR

6.1 System development and design dimensions

The development and design of the automatic English writing evaluation system should not be confined to evaluate students’ English writing, but also need to combine with the classroom teaching to form a diversified automatic evaluation model. Therefore, the following dimensions should be covered before designing the
6.1.1 Establish the database

Database is the key to the system. Teachers need to enter the correct grammar, context, vocabulary and other related factors to ensure that the system can really use the contents of the database when evaluating students' writing. Problems existing in students’ writing like the lack of cohesion, incorrectly use of vocabulary and grammar and other issues should be identified by the system. In addition, guided by their own teaching experiences, teachers need to input the key points that students are easy to make mistakes. Moreover, teachers’ comments should also be typed into the system to avoid the rigid evaluation of the system. At the same time, teachers need to type the basic information and learning habits of students, making the system evaluate students’ writing in a more targeted way and offer personalized advice to them.

6.1.2 Online correction and offline comments

As a kind of auxiliary tools, automatic English writing evaluation system can effectively improve the efficiency of the evaluation of students’ English writing for teachers. But there is still a big gap between the digital intelligence of information technology and teachers’ teaching. The leading role of teachers is irreplaceable. Therefore, in order to effectively promote the writing teaching process and the correct use of automatic evaluation system, first of all, it is necessary to combine the automatic evaluation system with teachers’ commentary. Thus, on the computer students can create articles, which will be evaluated by the automated evaluation system, and a feedback report will be sent both to teachers and students. Then, teachers can make a summary based on such reports in time and publish them in the evaluation system, so that students will know how their own articles are written. In addition, the system will provide related sample articles to students based on the database and point out what should be improved in students’ articles. Students will be guided to modify their own articles. See Figure 1 for details.

![Figure 1. The flowchart of automatic English writing evaluation system](image)

6.1.3 Online correction and inter-evaluation among students

By participating in the evaluation, students’ sense of responsibility will be enhanced effectively, and their sense of error correction will be developed. They will have a deep impression on the error-prone points. And in the traditional automatic writing evaluation system, there is no function of inter-evaluation among students, resulting in the stodgy of online evaluation. After the automatic correction by the system, each student will be assigned an article to read and correct. Then the article will be corrected by the system again, both mistakes and the well-written sentences will be pointed out.

6.1.4 Online correction and group evaluation
Teachers can put the title of the article students will write to the system in advance, as well as the relevant knowledge, the difficult points and the easy-to-make-mistake points. Students’ articles will be classified into different categories according to their type, so that the system can do comparative analysis to point out the difficult and the easy-to-make-mistake knowledge points based on the database. Meanwhile, suggestions of amendment will be given without changing students’ original intention.

6.1.5 Online correction and self assessment

Students will make a self assessment of their learning habits, which is very important for the system. Before using the system to make automatic evaluation on their writing, students should type their own views on such articles and their own evaluation of their writing into the system. Thus the system can use the database to modify the article on the basis of the contents provided by both teachers and students. The advantages and shortcomings of students’ writing will be pointed out by the system and students will know their true writing ability.

6.2 Model building

6.2.1 Theoretical model building

![Figure 2. Theoretical model](image)

According to the above-mentioned relevant dimension of the automatic English writing evaluation system, a three-level evaluation model can be constructed. The first level mainly refers to the evaluation and modification of the system according to the database typed by the teacher. The second level mainly refers to the targeted comparison and evaluation of the system according to teachers’ grouping of students and students’ self-evaluation. The third level mainly refers to the comprehensive evaluation on text themes, structure, convergence and content carried out by the integrated network, database, students and teachers, and ultimately the formation of a comprehensive comment. See Figure 2 for details. Students’ articles can be further explored and evaluated, and opinions for improvement and related learning suggestions will be given.

6.2.2 Operational model building

The system is designed to evaluate nine times. Firstly, Students submit their articles to the system after completion and gain the timely evaluation. Then each article can be randomly evaluated by the students, after which the system will give a comprehensive evaluation based on the database. At this time students need to modify their articles according to the evaluations and complete the second draft. Next, the second draft will once again get the automatic writing evaluation and interactive evaluation among students. After repeated modification, students can get multiple evaluations. When students finish writing their third draft, the system will give the feedback sheet, including the comprehensive evaluation on students learning process based on the input targeted information and the database of knowledge by teachers. At the same time, suggestions on how to modify the articles will also be given to the students. And students will be informed about the advantages and shortcomings of their articles. However, the system cannot really simulate people’s way of thinking and appreciation, thus it needs to give correct feedback according to the writing task, syntax, vocabulary, convergence, integrity, accuracy and other evaluation dimensions.
7. EMPIRICAL RESEARCH AND ENLIGHTENS

7.1 Empirical research

The study has two groups, one is the experimental group, and the other is the control group. After selection, the experimental group has 76 students teaching by teachers of the research and development group, the control group has 73 students. The writing task is the one of the CET4 in June and that of the CET4 in December in 2016 respectively. To ensure validity and reliability, the total of the 149 students in the two groups should make sure that they have never seen the writing task before. The veteran English teachers should type into the system contents according to the syntax, vocabulary, coherence and accuracy. Students in the experimental group submit their compositions through the system guided by teachers. Then the students will input their self learning assessment. Finally, the system will mark the articles based on the four dimensions input by teachers. The total score will be set to 20 points, each dimension has five points, at the same time, in the feedback sheet, suggestions column will be designed, then content in Table 1 will be obtained. Teaching model and effect are shown in Figure 3.

Table 1 Samples of English writing

<table>
<thead>
<tr>
<th>number of times</th>
<th>classes and grades in school</th>
<th>number of students</th>
<th>mean value</th>
<th>standard deviation</th>
<th>inequality</th>
<th>t</th>
<th>free degree</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>experimental class</td>
<td>76</td>
<td>13.11</td>
<td>1.519</td>
<td>0.15</td>
<td>0.589</td>
<td>147</td>
<td>0.557</td>
</tr>
<tr>
<td></td>
<td>controlled class</td>
<td>73</td>
<td>11.96</td>
<td>1.513</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>experimental class</td>
<td>76</td>
<td>15.42</td>
<td>1.948</td>
<td>1.23</td>
<td>4.118</td>
<td>147</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>controlled class</td>
<td>73</td>
<td>14.19</td>
<td>1.680</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 3. Teaching model and effect of the automatic evaluation system

7.2 Enlightens

The construction of the system is mainly for students whose mother tongue is Chinese. However, students in different regions show their own characteristics in the process of writing, so further study on the design of such systems is needed to carry out. Besides, we must not only fully understand the characteristics of Chinese
students in English writing, but also need to know the scoring elements of students of ethnic minorities. We need to devote great efforts to develop automatic evaluation system that is suitable for Chinese students. In addition, the system still needs to be studied and explored with a large number of teaching experiments in order to find more problems on technical and knowledge level. The rigid evaluation process should be improved, the evaluation well-directed, and the blindness of evaluation avoided.

8. CONCLUSIONS

Writing is a kind of language communication behavior, relating to the understanding and consultation of the meaning between the writer and the reader. Therefore, in the learning process, it is necessary for students to understand the ultimate goal of language using. The development of automatic evaluation system based on functional grammar can effectively enhance students' English ability, but there are still some inherent defects. As an educator, it is important to understand the running of the system, and pay attention to make best use of its advantages and avoid its weaknesses. By giving full play to the auxiliary role of the system, students' English proficiency will surely be enhanced.

REFERENCES