Research on Principles of Designing Computer Assisted Writing Feedback Technology in EFL of Basic Education under the Guidance of Process-Oriented Writing Approach

Binbin Chen[a],* Rui Zhang[b]

School of Computer and Information, Qiannan Normal University for Nationalities, Duyun, Guizhou, 558000, China

[a] zee9734@qq.com, [b]zee2624@163.com

*corresponding author

Keywords: Product-Oriented Pedagogy, Process-Oriented Writing Approach, Teaching of Writing, EFL, CALL

Abstract: Product-oriented pedagogy was born from the deep exploration and practice of psychology in teaching. It has been widely used in writing teaching and achieved remarkable results, forming a process-oriented writing approach. However, the status of EFL teaching in China does not meet the requirements of process-oriented writing approach for writing teaching. Under the basic condition of unbalanced teacher-student ratio and heavy teaching tasks, it also faces the problem of extremely unbalanced distribution of educational materials between urban and rural areas. Computer-assisted writing teaching technology, especially basic EFL teaching, should be a efficient instrument to solve this situation. However, due to the fact that most of the existing computer-assisted writing techniques are proposed and designed by computer professionals, and few pedagogic and linguistic experts participate in them, the existing techniques lack the guidance of relevant theories, resulting in many problems that do not meet the expectations of EFL teaching. This article attempts to propose the basic principles, aspects and effects of the design of computer-aided writing technology, combining the cutting-edge computer technologies, the actual situation of basic EFL writing teaching in China and the requirements of Process-oriented writing approach.

1. Introduction

In the mid-1860s, Product-oriented Pedagogy played a leading role in the teaching of writing. The teaching method originates from behaviorism theory, the core idea of which is to enable students to imitate and acquire foreign language knowledge and skills through continuous stimulation reaction (i.e. concentrated language training) (Nunan, 1999). The product-oriented

pedagogy focuses on testing grammatical rules and the use of language. Many researchers have realized that product-oriented pedagogy ignores that writing is a complex cognitive activity, not a mechanical input and output process. Since the 1960s and 1970s, with the emergence of psycholinguistics, the traditional product-oriented pedagogy has been gradually replaced by Process-oriented Pedagogy (Chaudron, 1987). Based on the theory of interactionist theory, Product-oriented Pedagogy emphasizes that the writing process is a communicative activity between teachers and students, and between students and students. Product-oriented Pedagogy emphasizes feedback and modification in the writing process. Feedback and modification run through the whole writing process. By doing so, students' cognitive ability, thinking ability and writing ability are improved. In the process of writing teaching, timely and accurate feedback, as an important tool for teaching interaction, promotes the effective writing and thus improves the students' writing accuracy. As an effective and reliable teaching method for students and teachers, written feedback has been widely used in second language writing classes.

However, written feedback is difficult to implement and achieve good results in remote areas of China where the optimization of educational resources allocation is weak. The development of computer-assisted English as a foreign language writing technique is an icebreaker of this dilemma. The Natural Language Processing technologies represented by artificial intelligence is changing everyday. Now the technology in this field has entered the field of first-line teaching and has made remarkable achievements. However, due to the fact that most of the existing technologies are dominated by computer experts and few linguists and pedagogic professionals participate in them, many technologies and products cannot fully meet the professional and practical needs of foreign language teaching. Therefore, this paper will put forward design and development suggestions on computer-assisted foreign language writing technology based on the theoretical and practical basis in the field of language teaching, hoping to play a reference role in the integration and development of teaching and computer.

2. The Requirements of Process-Oriented Writing Approach for Writing Feedback

Fine and effective feedback not only indicates whether it is correct or not, but also provides suggestions for modification or performance improvement (Zamel, 1982). After many generations of practice and verification of pedagogy and linguists, feedback theory has the following requirements for writing teaching:

First, clarity. Clarity of feedback is the premise for students to make expected corresponding activities (Conrad and Goldstein, 1999 , Freedman, 1984 , Ferris and Roberts, 2001), only clear and unambiguous revision feedback can be beneficial to writing (Polio, 2012).

Second, multiple times. Zamel believes that the main task of written feedback is to guide the repeated revision of writing in the process of instructional interaction (Zamel, 1982). The combination of multiple revisions and feedback in the writing process can be beneficial to the improvement of students' cognition, thinking and writing ability (Onozawa, 2010), which is also the core point of the process writing method. Second, multiple times. Zamel believes that the main task of written feedback is to guide the repeated revision of writing in the process of instructional interaction (Zamel, 1982). The combination of multiple revisions and feedback in the writing process can be beneficial to the improvement of students' cognition, thinking and writing ability (Onozawa, 2010), which is also the core point of the Process-oriented writing approach.

Third, timely. The timeliness of feedback is also extremely important. Research shows that students' writing scores can benefit from timely feedback-modification, which can be significantly

improved (Zamel, 1982 , Freedman, 1984 , Ferris, 1995 , Leki, 1990 , Beach and Friedrich, 2006). Research shows that if formative feedback is applied immediately and concretely in the teaching process of second foreign language writing, it has a significant impact on students' performance improvement (Beach and Friedrich, 2006).

In theory, multiple, continuous, timely, clear and targeted guidance and interactive feedback is the best way to improve writing ability. In order to maximize the feedback effect, it is necessary to put forward specific suggestions for improvement. It is also necessary to point out the bright spots and improvement points and explain the good or bad reasons, even identify the degree of good or bad and the reasons for the identification.

Unfortunately, the feedback received by students on writing products is mostly vague, global or inconsistent, and most of the feedback is delayed. In China's basic English teaching, especially in remote areas, it is difficult for teachers to practice the feedback theory. In the context of poor educational resources, teachers are required to provide personalized, long-term continuous and very detailed feedback for each student's writing or revision, which is almost impossible to complete.

3. Classification of Traditional Feedback Sources

In the traditional teaching of second language or foreign language writing, teachers are considered to be the only source who are qualified and able to give students the ability to make corrections. However, the introduction of process-based writing enables scholars to re-examine the source of feedback. The results show that peers and students themselves are also important sources of teacher feedback (Paulus, 1999 , Villamil and Guerrero, 1998).

3.1 Teacher Feedback

Teachers are the main source of feedback and play an important role in ESI/EFL writing teaching. Teacher's feedback refers to the information returned by teachers in order to improve and improve learners' composition level (Lewis, 2002). This information includes both form-focused feedback surface errors, such as corrective feedback, and discourse-oriented feedback, such as content and organization. In terms of methods, teachers usually use "marking method", "face-to-face criticism" and "centralized" feedback to provide learners with information about composition evaluation. The "marking method" feedback refers to the teacher using a pen or a pencil to simply mark the errors of the learners' written tasks (Lewis, 2002). The problem with the traditional "marking method" is that teachers only provide students with one-way writing instruction (Sommers, 1982 , Zamel, 1985), and the time spent on revision is much longer than that spent on reading by the learners. Compared with the traditional "marking" method, the "face-to-face" feedback implements two-way cooperation. "Concentrated" feedback refers to the teacher's feedback on all learners' learning tasks in the class, either orally, in writing or on a blackboard.

3.2 Peer Feedback

Peer feedback refers to the feedback given by classmates or group members to each other. This approach is widely used in the teaching of first and second language writing (Hyland, 2000 , McGroarty and Zhu, 1997). Its theoretical basis is mainly derived from the process writing approach and cooperative learning theory (Liu and Edwards, 2018) in the research of second language acquisition. The research shows that peer feedback is more beneficial to the improvement

of learners' language ability and learning interest. By critically reading peer's compositions, learners learn more about writing and revision, and enhance their confidence in successful writing (Arndt, 1993 , Keh, 1990).

3.3 Self Feedback

Self Feedback from the students refers to the learners' self-detection, modification and correction of errors in the learning process. Feedback from students themselves is also an important part in the research of feedback theory mechanism. Scholars generally believe that the advantages of self-correction lie in strengthening students' independence and cultivating students' autonomous learning habits. Through students' own mistakes, they will remember them better.

4. Computer Assisted Writing Feedback and Its Advantages

With the development of educational informatization and computer-assisted teaching technology represented by artificial intelligence, the automatic writing feedback technology based on cutting-edge computer technology is gradually approaching the level of artificial feedback.

In the 1960s, Automated essay scoring (AES) was developed to reduce the burden of evaluating a large number of students' works. Since the mid-1990s, the introduction of Automated writing evaluation (AWE) can provide more complex analysis of articles. In addition to automated scoring, they can also provide students with diagnostic feedback, including content, organization, vocabulary, grammar, spelling, etc. Li et al (2015) believes that AWE is personalized, timely and constant. "Timely" means that students can get feedback at the end of the writing task. The AWE program generates diagnostic feedback as soon as the student submits the paper. So AWE feedback performed better in this respect. Polio (2012) also advocates the importance of immediate feedback. She said that the timing of feedback is an important factor affecting the feedback effect (Polio, 2012). Secondly, "constant" refers to that students can receive consistent feedback (Li et al., 2015) and will not be subjectively influenced by teacher evaluation like manual feedback.

Therefore, the computer-assisted writing technology can basically meet the feedback requirements for "clarity", "multiple times" and "timely" in writing teaching. It can be another source of feedback compared with teachers, peers and self feedback.

5. The Guidance of Computer-assisted English Writing Feedback in Basic Education under the Process-Oriented Writing Approach

The teaching tasks of the basic education stage EFL are different from those of other stages in terms of teaching requirements and contents. The biggest difference is that the requirements on vocabulary and syntax are more important. It requires not only the precision of words and sentences, but also the maximum diversity of words and sentences, i.e. complexity. Moreover, among them, error correction is the most important and onerous task in artificial writing teaching. Teachers need to correct errors in grammar, structure, logic and syntax. However, most of the writing tasks in the middle school stage are proposition writing. Writing deviation from the topic is also a common problem in the basic education stage.

To sum up, in addition to meeting the basic requirements of the process writing approach, computer-assisted writing feedback should also take into account the special problems faced by EFL in the basic education stage. In order to better solve the above-mentioned problems, when building the writing feedback system, not only the stability of computer technology should be

considered, but also the problems and needs that may be encountered in teaching and testing should be considered.

The first thing that needs to be solved is the consistency of the topic and the content. As the existing computer technology including in-depth learning still has certain bottlenecks in semantic representation, how to identify the topic, topic and composition content is a big problem, and it is also one of the problems that the computer field has not yet felt. The specific difficulty encountered is that users can easily use some skills to cheat the computer and get high scores.

Secondly, in terms of feedback on the complexity of vocabulary and syntax, computer assisted feedback technology should give suggestions to improve users' level according to their level. However, judging from the existing technologies and products, the feedback process cannot provide reasonable feedback and suggestions based on the learning level. This is also a step that needs to be improved under the requirements of the Process-oriented writing approach.

Thirdly, in terms of accuracy feedback. The existing AES technology has entered the natural language processing technology which mainly uses the neural network technology, and has been able to deal with the vocabulary errors in the composition in a relatively good condition, and the feedback from users in this respect is also relatively good. However, in writing, especially in basic education, it is particularly important to use syntax correctly. Unfortunately, there is still much room for improvement in syntax processing in the prior art, which requires the concerted efforts of educators and technicians.

Finally, for the content of writing, the most important evaluation indicator is fluency. Whether the logic, structure and organization of the article are clear and reasonable, and whether the discussion is sufficient are important indicators to measure whether a composition is qualified. Due to the general weakness of computer technology in content identification, the existing computer writing assessment technology cannot carry out or properly carry out feedback and suggestions on this indicator.

6. Conclusion

Computer-assisted writing feedback has been developed for many years, especially in AES and AWS. However, due to the lack of participation of linguistic and pedagogical experts and front-line teachers in the development process for decades, it is less guided by rational linguistic and pedagogical theories in the development process. This paper mainly discusses the basic guiding principles of process writing, which is widely respected in the field of artificial teaching, and puts forward the development direction and suggestions of computer-aided writing technology based on its characteristics and present situation.

References

[1] ARNDT V 1993. Response to writing: Using feedback to inform the writing process. Teaching composition around the Pacific Rim: Politics and pedagogy: 90-116.
[2] BEACH R, FRIEDRICH T 2006. Response to writing. Handbook of writing research, 1.
[3] CHAUDRON C 1987. Analysis of Products and Instructional Approaches in Writing: Two Articles on the State of the Art: Introduction. TESOL quarterly, 21: 673-675.
[4] CONRAD S M, GOLDSTEIN L M 1999. ESL student revision after teacher-written comments: Text, contexts, and individuals. Journal of second language writing, 8: 147-179.
[5] FERRIS D, ROBERTS B 2001. Error feedback in L2 writing classes: How explicit does it need to be? Journal of second language writing, 10: 161-184.

[6] FERRIS D R 1995. Student reactions to teacher response in multiple‑draft composition classrooms. TESOL quarterly, 29: 33-53.

[7] FREEDMAN S W 1984. The Evaluation of, and Response to Student Writing: A Review.

[8] HYLAND F 2000. ESL writers and feedback: Giving more autonomy to students. Language teaching research, 4: 33-54.

[9] KEH C L 1990. Feedback in the writing process: A model and methods for implementation.

[10] LEKI I 1990. Second Language Writing: Coaching from the margins: issues in written response.

[11] LEWIS M. Giving feedback in language classes: SEAMEO Regional Language Centre,2002

[12] LI J, LINK S, HEGELHEIMER V 2015. Rethinking the role of automated writing evaluation (AWE) feedback in ESL writing instruction. Journal of second language writing, 27: 1-18.

[13] LIU J, EDWARDS J H. Peer response in second language writing classrooms: University of Michigan Press,2018

[14] MCGROARTY M E, ZHU W 1997. Triangulation in classroom research: A study of peer revision. Language Learning, 47: 1-43.

[15] NUNAN D. Second Language Teaching & Learning: ERIC,1999

[16] ONOZAWA C 2010. A study of the process writing approach. Research Note, 10: 153-163.

[17] PAULUS T M 1999. The effect of peer and teacher feedback on student writing. Journal of second language writing, 8: 265-289.

[18] POLIO C 2012. The relevance of second language acquisition theory to the written error correction debate. Journal of second language writing, 21: 375-389.

[19] SOMMERS N 1982. Responding to student writing. College composition and communication, 33: 148-156.

[20] VILLAMIL O S, GUERRERO M C D 1998. Assessing the impact of peer revision on L2 writing. Applied linguistics, 19: 491-514.

[21] ZAMEL V 1982. Writing: The process of discovering meaning. TESOL quarterly, 16: 195-209.

[22] ZAMEL V 1985. Responding to student writing. TESOL quarterly , 19: 79-101