Understanding Learners’ Cognitive Abilities: A Model of Mobilizing Non-English Majors’ Cognitive Abilities in the Process of Their Writing in English

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Introduction

Previous researches on non-English majors’ writing in English mainly focus on the case studies of process-oriented writing, collaborative writing, writing through groups, cohesive ties and chains, or writing strategies used in non-English majors’ English writing. Little research has been done on the relationship between learners’ cognitive abilities and their writing products. “The correlations between aptitude tests and learning of success are due not to a distinct aptitude, but instead to the operation of general cognitive abilities or intelligence” (Skehan: 208) and “educational successes are able to mobilize cognitive abilities to help in the task of language learning” (Skehan: 209). This study is intended to discuss how to mobilize non-English majors’ cognitive abilities in the process of their writing in English in a class with large numbers and to see whether there is a correlation between successful writings and the mobilizing of the learners’ cognitive abilities. The result of the study shows that the more the subjects’ cognitive abilities are mobilized, the more actively the subjects are involved in; the more interested the subjects are in the writing, and the greater progress they make either in making less language mistakes or in being more relevant to the writing topic.

I. Definitions of cognitive abilities

According to Neisser, cognitive abilities are those which transform, reduce, elaborate, store, recover and use the sensory input. From Webster's Dictionary's definition, cognition can be defined as “the act or process of knowing in the broadest sense; specially, an intellectual process by which knowledge is gained from perception or ideas”. It is agreed that when applying the cognitive approach to learning and teaching, teachers focus on the learners’ abilities to think, remember, learn and use language. Some argue that in writing, learners’ memory, kinds of knowledge, reasoning and problem-solving abilities are involved. Some others hold that if the learners are able to understand the connections between concepts, breakdown information and rebuild them with logical connections, then their retention of material and understanding will increase. All these definitions and findings about cognitive abilities share in common with each other the importance of memory, kinds of knowledge, and the abilities of using language.

II. Designing writing models

Is it true that “those who are educational successes are more able to mobilize cognitive abilities to help in the task of language learning” in non-English majors’ large-sized classes? Is learning success really due “to the operation of general cognitive abilities”? Almost all the studies
on non-English majors’ English writing advocate collaborative or group writing. The problem is that it is difficult to ask students of large-sized classes to write in groups. First of all, it is impossible for non-English majors in our university to write in class, because they have only two and a half periods (with each period 40 minutes) for intensive reading per week. There is no writing course for non-English majors, either. Second, when they were assigned to write in groups after class, they did not work together, for they just selected one of the group members to write it and then handed it in. And third, they are also busy with other courses, some of whom have three or four lectures to attend a day, that is to say, every day they are busy going from one classroom to another for the first two years. Based on these questions and the real study situation in our university, A writing model is designed which is different from the traditional one our students have been practicing so as to find the answers to these questions, explore a flexible writing model for non-English majors in our university and pave the way for college English curriculum reform.

Subject and tool

The subjects are 108 non-English majors enrolled into Southwest Normal University in 2002. 49 of them are from the Department of Educational Technology (Class E) and the other 59 are from the Department of Electronic Commerce (Class C). The compositions are the outlined ones used in CET-4 from the year 1996 to the year 2001. Both classes wrote the same composition with the same titles and the same directions. They wrote their compositions every two weeks. Altogether they wrote 7 compositions. The students in both Class E and Class C were required to write their compositions after class. And the differences lie in their practicing of different writing models. Class E practices the traditional writing model and Class C practices the newly designed one (see figure 1). The tools used in this study are a projector, CET_4 composition scoring criteria and the corresponding range finders, and the composition grade scale (Das, 1999: 96): compositions are graded on the expressing of ideas, organization of the composition, word choices, specifics such as the syntax, spelling, punctuation, etc., and creativeness. After-discussion questionnaires, after-writing questionnaires and interviews are also adopted.

At the very beginning the new model was different from the traditional one only in comment: the whole class C and the teacher together made comments and suggestions on their compositions on a projector. Based on the practices of the new models, on the observations, on the analysis of the subjects’ need in writing and on their feedbacks on the new writing models, the following improved newly designed writing model has been built, which is popular with the subjects in Class C. And it has been tested a suitable and successful writing model for the subjects in Class C.

![Writing Model Diagram]

Class E

1. Writing Task

2. Writing Individually

Class C

Stage 1: analysis of structured writing and group discussing of the writing task, the CET-4 scoring criteria, the corresponding range finder and the composition grade scale

Stage 2: writing individually
Stage 3: pair work: peer reading and scoring of compositions
Stage 4: collecting of all compositions with peer comments
Stage 5: revising and suggesting in class with the help of a projector

Figure 1 Writing Models for Class E and Class C

III. Findings and analyses

Finding 1: In the subjects’ first writings, the main mistakes in their compositions are sentences without verbs, nouns wrongly used as verbs, verbs used as nouns, tenses wrongly used, subject-verb disagreement, inappropriate collocations, incorrectly used inversion, the –ing form of a preposition used after the verb (see Tables 1 and 2). A few compositions had organizational markers. Each week, all the composition exercise books of both classes were collected, and mistakes were recorded, classified and analyzed. The different degrees of improvement of the subjects’ writings lie in the following aspects:

Table 1: Main Mistakes Made by the Subjects in Class E in the 7 Writings

<table>
<thead>
<tr>
<th>Mistakes</th>
<th>Class E</th>
</tr>
</thead>
<tbody>
<tr>
<td>total number: 49</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Sentence without verbs</td>
<td>15</td>
</tr>
<tr>
<td>Using nouns as verbs</td>
<td>32</td>
</tr>
<tr>
<td>Tense mistakes</td>
<td>17</td>
</tr>
<tr>
<td>Inappropriate collocation</td>
<td>11</td>
</tr>
<tr>
<td>Incorrect inversion</td>
<td>3</td>
</tr>
<tr>
<td>Preposition’s –ing form</td>
<td>4</td>
</tr>
</tbody>
</table>

1: the first writing  2: the second writing  3: the third writing  4: the forth writing  5: the fifth writing  6: the sixth writing  7: the seventh writing

Table 2: Main Mistakes Made by the Subjects in Class C in the 7 Writings

<table>
<thead>
<tr>
<th>Mistakes</th>
<th>Class C</th>
</tr>
</thead>
<tbody>
<tr>
<td>total number: 59</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Sentence without verbs</td>
<td>16</td>
</tr>
<tr>
<td>Using nouns as verbs</td>
<td>27</td>
</tr>
<tr>
<td>Tense mistakes</td>
<td>15</td>
</tr>
<tr>
<td>Inappropriate collocation</td>
<td>13</td>
</tr>
<tr>
<td>Incorrect inversion</td>
<td>2</td>
</tr>
</tbody>
</table>
Preposition’s –ing form

<table>
<thead>
<tr>
<th></th>
<th>2</th>
<th>0</th>
<th>2</th>
<th>1</th>
<th>0</th>
<th>1</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td>1: the first writing</td>
<td>2: the second writing</td>
<td>3: the third writing</td>
<td>4: the forth writing</td>
<td>5: the fifth writing</td>
<td>6: the sixth writing</td>
<td>7: the seventh writing</td>
<td></td>
</tr>
</tbody>
</table>

The number of the subjects in Class E who still constantly made the same language mistakes almost keeps the same while the number of the subjects in Class C who made the same mistakes drops dramatically. When comparing the results (Tables 1 and 2) of the two different models, we find that the subjects in Class C made greater improvement than those in Class E in making less language mistakes. Meanwhile, the writing products of the subjects in Class C indicate they did better in topic relevance than those in Class E. The improvement of the subjects’ (in Class C) writing abilities in language using and in topic relevance is closely related to the mobilizing of the subjects’ cognitive abilities.

To start with, as the two different writing models have demonstrated, the subjects in Class C are more involved in cooperation and interaction than those in Class E. The writing process of Class C is more interactive, and more dynamic. For Class E, their language mistakes were pointed out and corrected with some encouraging words written on the their composition exercise books. So the improvement of writing of the subjects in Class E depends largely on their self-reflection on their own mistakes and on their desire and their hard work to write well. And the writing process of Class E is relatively more static and more silent.

Second, compared with the mobilizing of the cognitive abilities of the subjects in Class E, the cognitive abilities of the subjects in Class C were mobilized better. First, the way of assigning the task was different. The subjects in Class C were allowed to have a five-to-ten-minute group discussion about the writing topic in class while the subjects in Class E were just given the writing assignment without any oral communication about the writing topic. In the process of discussing, the subjects’ cognitive abilities such as the abilities to think, express, and store the information discussed were mobilized. The after-discussion questionnaire and the interviews of some of the subjects showed that discussing about the writing topic before writing can help them understand more clearly what will be focused on in their writings. Discussing functions as planning as well.

Third, as is shown in the writing model for Class C, the third stage is what Class E does not have, either. In this stage, the subjects have to read and score one of their peers’ compositions. On the one hand this activity provides the subjects with the opportunity to work as a teacher to get to know how to score a composition according to the CET-4 composition scoring criteria, the corresponding composition range finder, and to Das’ composition grade scale. On the other hand in the process of scoring and making comments the subjects get to know what matters in compiling a composition, especially a good one, or an excellent one. Meanwhile, reading and scoring their classmates’ compositions, they would find some better ways of expressing the same ideas, they learned something from their classmates, and they thought about their own compositions too what should be improved in their own writings. In this stage the cognitive ability of thinking is stressed. And this is in accordance with the results of some researches (M.B. Tinzmann, B.F. Jones, T.F. Fennimore, etc.) which indicate successful learning also involves an interaction of the learner, the materials and the context.

The fifth stage is as critical as the former stages. Forty minutes per week is used to analyze the compositions with scores and comments made by their peers. Everyone was involved in thinking, commenting, or re-commenting the composition being displayed on the projector,
questioning the writer or the critic (the subject who made the comment), providing more appropriate expressions, giving suggestions or offering encouragements. In this activity, the subjects learn to be a critic, a teacher, a listener, a debater, an observer and a writer as well. They learn, in a general way, to tackle invention, global revision and then local revision. They learn to see how to use their memories and express their ideas. The teacher is no longer the only one to make a comment about each writing. This stage shows that effective communication and collaboration are essential to mobilizing the subjects’ cognitive abilities to write a good composition or an excellent one.

Another most striking point of the writing model for Class C is that it demonstrates that the whole class or a learning group or pairs within the class can accomplish meaningful learning and solve problems better than any individual can alone.

In addition, in the process of practicing the writing model for Class C, some other attracting and exciting characteristics are found.

First of all, stage one, stage three and stage five give the subjects time and opportunities to communicate with each other about the writing. They are fully interacting with each other in revising their own compositions. Second, these three stages also have in common the making use of the subjects’ audio and visual abilities. And third the illustration, the group discussion and the practicing by doing are also involved in this model. From the discussing, conceiving, writing, reading and scoring of the compositions to the whole-class revising of the compositions, the subjects are active both mentally and verbally. This active atmosphere helps to activate the subjects’ mental knowledge related to the writing task. And the writing activities become a process and a recursively cognitive one. The subjects’ cognitive abilities of recognition and organization about the topic are mobilized too. It is primarily through the dialogue and different perspectives that the subjects become knowledgeable, strategic, self-determined and empathetic — the characteristics of successful learners. Moreover, involving the subjects in real context composition analyzing and linking new information to their prior knowledge all require effective communication and collaboration among teachers and the subjects. Last but not the least, this study also suggests the importance, the necessity and the feasibility of strengthening the subjects’ procedural knowledge as well. The automating of some of the procedural knowledge contributes a lot to the improvement of the subjects’ writings and writing abilities.

Figure 3  A Model of Mobilizing the Subjects’ Cognitive Abilities
Finding 2: Based on the observations and on analyzing the deep mental activities or the information processing of the subjects (in Class C) involved in dealing with the writing task, I found that after the third writing, when faced with a new writing task, they did not begin by “writing” but by thinking and by having a global idea about the writing task. The subjects not only pondered what the writing would focus on but also planned how to organize the writing appropriately:

- What declarative knowledge will be relevant and
- Which procedural knowledge will be useful and appropriate in approaching the writing task.

Once the writing task has been comprehended by linking it to what they have already known, the prior knowledge (Carroll, 2000; Wang Su, 2001), the new information in the writing task can then be constructed and kept in the subjects’ mental knowledge more easily through the writing activities which enrich the connections between the new and old knowledge, and the connections between declarative knowledge and procedural knowledge as well. Elaboration here refers to the subjects’ methods or activities of linking the new information in the writing task to the prior knowledge so as to let the two become more deeply connected. The cognitive process of the writing model for Class C can be described as follows:

![A Cognitive Model of Writing (Class C)](image)
IV. Conclusion

In this paper, the study has answered the two questions put forward at the beginning of this article and argues that the more the subjects cognitive abilities are mobilized, the greater progress they make in the process of their writing in English. In the practicing of the writing model for Class C, the subjects can share their knowledge and contribute to the pool of information or even to their mental knowledge network. That the subjects in Class E are less successful in improving their writings also supports Sweller’s cognitive load theory which holds that the simultaneously presented multiple information elements impose a heavy cognitive load upon the learner and threatens successful learning. It is clear that the writing model for Class C puts the multiple information elements into four different stages (stages1, 2, 3 and 5 ) and this greatly reduces the students cognitive load in the process of their writing. Therefore this model facilitates the subjects’ writing and paves the way for the subjects’ successful writing. Mobilizing the subjects’ cognitive abilities in the process of their writing in English in an interactive way can overall improve their writings. The cognitive writing model in this study is not uniform but flexible and it can be changed according to different teaching and learning situations and different subjects or tools.
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