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A Corpus-based Teaching Design of Junior High School English Reading from the Perspective of Schema Theory

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Abstract

This paper takes the reading text The Night The Earth Didn't Sleep in Unit 4 of English for senior high School published by People's Education Press as an example to probe into the concrete process of designing English reading teaching activities assisted by corpus in senior high school under the guidance of schema theory. Through the word frequency list extracted from corpus, students are guided to predict the main topic of the text, so as to realize the lead-in of reading text, and trained to predict and to grasp the main facts, further to explore the content of articles and paragraphs through keyword list and concordance line, so as to map the text structure, which may contribute to students' reading skills of skimming and grasping key information; Finally, the corpus-based approach can also be used in the teaching of vocabulary and grammar at the linguistic level after acquiring the structure and content of the text at a macro level.

Keywords— Corpus-based, English Reading, Teaching design, Schema Theory

I. INTRODUCTION

Reading teaching is one of the major parts of English teaching. The English Curriculum Standard for Senior High Schools (2017 Edition, 2020 Revision) makes clear requirements for students' English reading ability: in the reading comprehension of English essays, they should have a complete understanding of the main theme and essence of the article, they also can infer the meaning of strange words in the passage by combining the information from the upper and lower parts of the article. Furthermore, students should sort out the basic structure of the article, analyze the purpose and attitudes of authors and internalize the cultivation viewpoints conveyed by texts through reading (Ministry of Education of the People's Republic of China, 2020). However, the conventional teaching strategies that place an emphasis on the transmission of language knowledge, such as words and sentences, continue to be prevalent in actual high school English reading education. Students passively memorize words and analyze sentence structures, and students' low efficiency in acquiring information, coupled

with the lack of relevant vocabulary and background knowledge, reading remains a difficult problem for many students. Although teachers fulfill their teaching tasks, it is difficult to improve students' output ability in the long run. Research and exploration on how to improve the teaching of English reading in high school has been widely concerned by academics. What's more, in order to realize the above requirements, teachers have begun to explore the integration and innovation of information technology and classroom teaching in practical teaching, and try to use corpus technology to design English reading classroom teaching (Liaw & English, 2017). Moreover, schema theory, one of the supporting theories for reading teaching, can be skillfully integrated with corpus idea to construct a new English reading teaching model.

Rumelhart (1980) classifies schema into three types: linguistic schemata, content schema and formal schema (also called structure schema), which are cross-referenced and interact with the language, content and form of the reading material to determine the reader's understanding of

the reading material. Sun (2003) also points out that schema theory holds that learners' reading ability is determined by three schemas: she further explains that linguistic schema means to knowledge about vocabulary, idioms, syntax and grammar of the text; content schema refers to familiarity with the content related to the topic of the text or past experience and background knowledge about the content of the text; Structure schema refers to the knowledge of text types and organizational structure differences. Three schemata are closely related to reading comprehension. Constructing these three schemas in the process of reading will help students understand reading materials from multiple dimensions, thus improving the comprehensive effect of reading. Schema construction is a process of continuous analysis and synthesis under repeated contact with similar contexts. Corpus can deconstruct texts by virtue of its unique ideas and unique tools, and construct certain discourse schemas in learners' brains, which ultimately help learners achieve the purpose of reading texts (Rasakumaran & Patrick, 2019; Xu & He, 2004). Specially speaking, Corpus method helps learners construct the structure schema of a text by means of word frequency list and keyword list, so that learners can understand the logical relationship between the theme and paragraphs of the text; meanwhile, the co-occurrence function of index lines and keyword context can help learners explore the details of the text, correctly judge the theme, reasonably infer the implied meaning, and thus construct the content schema of the text, which are consistent with each other in this perspective.

In short, schema theory can be effectively combined with corpus technology, providing new ideas for reading teaching. Therefore, under the guidance of schema theory, this paper takes the reading text *The Night The Earth Didn't Sleep* in Unit4 as an example to explore the reading teaching procedures assisted by corpus, and tries to focus on the theme of the discourse from the high-frequency words and keywords of the text. At the same time, with the help of the characteristics of corpus context co-occurrence, reading activities are designed to guide students to grasp the main idea, topic connotation, chapter structure and stylistic features of the article, vocabulary knowledge and grammatical structure layer by layer through observation, sorting, generalization, judgment and guessing, so as to promote their comprehensive reading literacy.

II. RESEARCH REVIEW

On the one hand, the research about schema-based English reading teaching has never faded from scholars' attention. Al-Issa (2006) suggested that readers' language competence is not only based on the activation of language knowledge, but also on the degree of activation in knowledge processing. That's to say, Teachers are supposed to activate students' relevant schemas by kinds of reading activity in class. Then Ajideh (2006) proposed a schemabased pre-reading task for one of ESP textbooks to help students activate their background knowledge. He also said teachers should highlight those elements closely related to the topic of the theme in order to accelerate students to activate relevant schemas. Gu (2013), from the perspective of students' cognitive psychology, also points out that effective activation of schemas in pre-reading activities can meet students' cognitive needs in the reading process, lay a foundation for subsequent reading, and help students comprehensively apply what they have learned and personal experience in understanding and internalizing text information. After the empirical research on 63 English learners, Hassan et al. (2013) equally improved that activation of schemas and background knowledge can improve English learners' reading comprehension, and interactive reading method based on schema theory can help readers better understand texts. Zheng et al. (2017) further verified the effect of schema activation on reading comprehension in empirical research, and the experimental results confirmed that schema activation is a key link in comprehension. All the research reading demonstrated that the application of Schema in do help students enhance their reading comprehension, and in return the schema itself can be fed back while students' learning and teachers' teaching. So, applying schema theory to every link of reading teaching can optimize reading teaching mode and improve reading teaching quality.

On the other hand, Corpus is a collection of scientifically collected language samples, which can help users analyze and study the characteristics of language and the rules of its use. In the teaching field, the exploration of corpus-assisted English reading teaching is gradually attracting academic attentions, and many researchers and front-line teachers have carried out practical research on the integration of corpus and reading teaching. Wang (2013)

investigated and analyzed five corpus-based teaching activities: how to understand the main content of the text, to extract the main line of the story, to clarify the reference relationship, to repeat the text, and to make reasonable guesses according to the context, and provide detailed teaching cases one by one in his paper.

Erickson & Thiessen (2015) also believed that those teaching cases deserve to be carried out because they pointed out that the language input provided by real corpus can promote students to change different reading strategies according to different text contents and master knowledge points in the exploration of language rules independently. In addition, it can also improve students' self-feedback ability and enhance students' sense of achievement and selfconfidence. Wang (2014) analyzes the how corpus-based vocabulary teaching model on word chunks and collocations in bottom-up reading processing and on text keywords in top-down reading processing work and indicates that corpus-assisted reading teaching model benefits students in expanding students' linguistic schema, content schema and structure schema. Xu & He (2016) discussed the corpus-assisted English intensive reading teaching mode, trying to start with the key words of the text, focusing on the core problems of the text, and at the same time displaying various co-selection situations of text words from bottom to top by means of corpus, designing reading tasks, guiding students to grasp the theme, sub-topic connotation, text structure and even writing style of the article through observation, sorting, generalization and judgment, so as to improve students' reading literacy. Furthermore, He, Liang & Tang (2017) concretely illustrate the application of keyword lists, word frequency lists and clusters frequency lists in corpus-assisted reading teaching with specific examples, proving that keyword lists can highlight the characteristics of words used in articles and the main idea of articles, for example, grammatical words can often reveal the style of texts; word frequency lists can reflect the word quantity, frequency, various forms of words and the difficulty of texts; and by extracting and observing the high frequency clusters from the cluster frequency list, it can be found out that the usage of high frequency clusters will reveal the general idea or style characteristics of the text. Ma & Zhang (2019) directly showed that corpus provides students with the possibility of using authentic language,

and that teachers can reduce the differences between the language taught in reading class and the language used by native speakers in practice by introducing corpus-based language research methods into English teaching.

As mentioned above, the process of reading is the process of schema activation and construction; and with the help of visualized corpus, students can stimulate and existing schema in their brains through induction and generalization, making autonomic connections between the reading text and their internalized knowledge, which can further students' autonomic learning and exploring. That's why Schema theory supports the application of corpus in English reading teaching theoretically. So, under the guidance of schema theory, how teachers build the efficient English reading teaching model by means of corpus technology has been widely concerned, and the above related research results have laid a theoretical foundation and valuable experience for the teaching design of this paper. Therefore, this paper will start with the self-built corpus and its application in reading teaching to introduce the concrete operation of constructing the reading teaching mode from the perspective of schema theory.

III. CORPUS-BASED READING TEACHING DESIGN

Based on the corpus-driven teaching model, this part uses information technology tools such as corpus to develop reading teaching design under the guidance of schema theory.

3.1 Teaching Content

The teaching content is selected from the reading textsThe Night The Earth Didn't Sleep of Unit4 in the first compulsory volume of English (2019) published by the People's Education Edition. This article is a narrative of news reporting, using a lot of detailed information, vividly reproduces the scene of Tangshan earthquake in 1976--the omen before the earthquake, the losses caused by the earthquake and the disaster relief after the earthquake, expressing the horror of natural disasters and the sympathy of the author for the people in the disaster areas, and finally sublimates the theme, transmitting the warmth of "disaster is merciless, while our people are full of love".

3.2 Teaching Aims

(1) In structure, students can understand the theme and

logical relationship between paragraphs from the word frequency list and keyword list presented in the corpus, and construct the organizational structure of the text.

- (2) In content, students can learn about the Tangshan earthquake: some abnormal phenomena before the earthquake, the devastating damage after the earthquake, the subsequent national rescue from the military and civilian, and how to solve the contradiction between building dams and protecting cultural relics.
- (3) In language, students can learn and comprehend the words, expressions and gramma point presented in the text.

3.3 Teaching Procedure

The corpus-based reading teaching activity proposed in this paper is divided into three steps: The first step is to prepare lessons before class. Teachers should create relevant teaching corpus, and then design related questions according to the text content and reading purpose. The second step is to present the text in class. Teachers begin with using the concordance line, word frequency list and keyword list to guide students to conduct discourse analysis, such as using high-frequency words and keywords extracted by corpus to let them imagine the theme and content that the article may elaborate; then, teachers make use of the cooccurrence characteristics of corpus to present the context guiding students to further explore the details of the text, locate key information, and then map the structure of the article. Finally, at the language level of reading teaching, teachers would carry out the contextual word guessing and collocation teaching, grammatical structure teaching, and some useful expressions teaching. The last step is to conclude the text, review the whole class, and assign homework for students.

(1) Preparation before class

1.The Night The Earth Didn't Sleep reading discourse is organized into text files, saved and named The Night.txt; and e_lemma.txt is prepared for identify all the forms of a lemma word and stop_word.txt will be used to exclude those function words in the text. Then, select the textbook corpora of English compulsory 1 to 3 of PEP as the reference corpus, which are much larger than the target corpus.

2. The classroom computer is turned on to run AntConc 3.5.9 software and the COCA Corpus website is visited to extract word frequency lists and keyword lists in class and

to view specific concordance information.

- (2) Presentation in class
- 1. Lead-in of the reading text

AntConc 3.5.9 is used to generate a word frequency list (see Table 1) after importing The Night.txt and e lemma.txt. The result shows that there are 545 words in this text. Among them, most of the words with the highest frequency are function words such as articles, conjunctions, prepositions and pronouns. If Teachers want to guide students to learn more accurate information, stop word.txt can be imported in and ran to get high-frequency content words (see Table 2): city (11), people (9), Tangshan (6), water (5), begin (began3; begun1), quake (quake3; quakes1), buildings (3), ruins (3), earthquake (earthquake1; earthquakes1), destroyed (2), injured (2) etc... Thereout, the teacher can lead the students to discuss to infer that the main topic of this reading article is the earthquake in Tangshan City. And then the teacher can ask the students to predict what things the article will talk about, what people there are, and when it will happen. The above-mentioned method of guessing the general idea of the text by using the words with high frequency enables students to obtain the background of the text content, construct part of the content schema of the reading text, lay a foundation for subsequent reading, train students' predictive reading skills, meanwhile, stimulate students' strong desire for knowledge.

2. Teaching for Structure and Content Comprehension of Reading Texts

After predicting the main topic of the text, teacher need to verify the story development and details by running AntConc's Keyword List to generate a keyword list (see Figure 1) and looking at the keyword line. Through the observation and analysis of the keyword list, the students' reading skills of skimming, searching and grasping key details will be also trained in the process of continuous discovery, retrieval and verification.

First of all, the teacher asks the students to pay attention to the title of the article-The Night The Earth Didn't Sleep, further learning that the earthquake happened at night. Then, let students observe and analyze the keyword list and found that the keyword list shows the general idea of the article more clearly than the word frequency list. It could guide the students to find that the first 20 words in the word frequency list were fewer content words, and the first

20 words in the keyword list are more content words, such as city, Tangshan, quake, people, water, chicken, pig, feel, dead, etc., which shows that the reading text would talk about the people and some animals in the Tangshan earthquake. Words like dead, ruins, began, survivors, etc. could show that the topic might revolve around the damage caused by the earthquake and what happened to the survivors. By this way, students' reasoning and analytical

skills could be developed naturally. It could also allow students to roughly grasp the main idea and tone of the article through the title and keywords before reading the article. And during this period, teacher could try to guide the students to predict the story, and then verify whether their description of the main story is correct by reading each paragraph of the article.

Table 1. Word Frequency List for The Night (Rank 25)

Rank	Frequency	Word
1	38	the (the 38)
2	28	of (of 28)
3	27	be (been 1; m 2; was 5; were 19)
4	23	and (and 23)
5	17	to (to 17)
6	12	in (in 12)
7	11	city (city 11)
8	9	a (a 8; an 1)
9	9	people (people 9)

Table 2. Content Word Frequency List for The Night (Rank 25)

Rank	Frequency	Word
1	11	city (city 11)
2	9	people (people 9)
3	6	tangshan (tangshan 6)
4	5	water (water 5)
5	4	begin (began 3; begun 1)
6	4	quake (quake 3; quakes 1)
7	4	thousand (thousand 4)
8	3	building (building 3)
9	3	dead (dead 3)

17	d Types:	16	Keyword Tokens	
Rank	Freq	Keyness	Effect	Keyword
1	11	+ 53.48	0.0529	city
2	6	+ 49.09	0.038	tangshan
3	4	+ 23.92	0.0245	thousands
4	5	+ 23.08	0.0278	water
5	3	+ 21.88	0.0192	kilometres
6	3	+ 19.58	0.019	quake
7	3	+ 19.12	0.0189	ruins
8	3	+ 18.7	0.0189	fell
9	3	+ 17.59	0.0187	dead
10	9	+ 17.57	0.0244	people
11	2	+ 17.16	0.0131	chickens
12	2	+ 17.16	0.0131	rose
13	2	+ 15.98	0.013	pigs
14	2	+ 15.08	0.013	wells
15	3	+ 13.79	0.0178	began
16	2	+ 13.74	0.0129	survivors

Fig. 1. Keywords List Surface in Antconc for The Night

Then, the teacher uses the Antconc to generate the

word frequency list of each paragraph to guide the students

around the six elements of the narrative (Time, place, people, reason, course and result). For the words related to the six elements, further observe the specific context to judge the general meaning and specific details of the paragraph. Finally, map the whole content and structure of this text according to the general meaning and story of the five paragraphs: the first paragraph talks about the signs before the earthquake, the second paragraph talks about the terrible scene when the earthquake occurred, the third paragraph talks about the tragic city after the earthquake, the fourth paragraph talks about the recovery of the city with the help of rescue workers and soldiers, and the fifth paragraph talks about the rise of the city due to the support of the government and the efforts of the people in Tangshan. Therefore, the students can know that the reading text is based on the sequence of events, presenting the experience of the city from a third-party perspective from before the

earthquake to after the earthquake.

The first paragraph was used as an example to show the detailed teaching design of this part. At first, from the first sentence of the first paragraph, "Strange things were happening in the countryside of northeastern Hebei." It can be concluded that the earthquake occurred in a village in the northwest of Hebei Province, accompanied by some strange things. So, the teacher would search the content words in the first paragraph through the word frequency list (see Table 3). After observing the specific context, Students can find that the strange things refer to the water rising and falling in the well, the cracks in the wall, the chickens and pigs are too anxious to eat, the dogs do not go home, the rats run around, the fish jump out of the water, the lightning appears in the sky, and there is a loud noise while people are still sleeping without knowing anything (see Table 4).

Rank	Frequency	Word
1	2	city (city 2)
2	2	fell (fell 2)
3	2	rose (rose 2)
4	2	water (water 2)
5	2	well (well 2)
6	1	chicken (chicken 1)
7	1	run (ran 1)
8	1	refuse (refused 1)
9	1	mouse (mice 1)

Table 3. Word Frequency List for Paragraph 1(part)

Table 4. Keywords in Context for Paragraph 1 (part)

Number	word	Keywords in Context
1	water	1, to hide, and fish jumped out of the water. At a
2	well	1 appeared in the well walls. At least one well ha
3	chickens	··· had some smelly gas coming out of it. Chickens and
4	dogs	even pigs were too nervous to eat, and dogs refus
5	people	··· were heard. But the city's one million people were

3. Teaching at the Linguistic Level after Comprehension of Reading Text

After grasping the structure and content of the text, the teaching of reading will transition to the language level. Here follows a word-teaching design, using the keywords--"destroy" and "damage " in the text as an example to show how to use the Corpus of Current American English (COCA) to carry out the instruction of synonym discrimination rather than students just stay there and listen to their teacher's interpretation for these two words.

Search for "destroy[V*]" and "damage[V*]" in the COCA interface Word field to get profiles of these two, which informing students roughly about some detailed information like register, definition, synonyms, topics, collocates even clusters (see Figure 2,3). Watching these two interfaces, students can quicky know that their usage difference in register that destroy was mostly used in web, TV and movies while damage is widely found in magazine and news, which may remind them to choose word according to different writing styles. As for explanation,

soundly. Damage: inflict damage upon. Also, in this

interface the SYNONYMS and TOPICS would relate

students to some similar information and help students

students can grasp that the destroy covers much border than damage. There are three pieces of meaning for destroy and only one for damage--Destroy:1) do away with, cause the destruction or undoing of; 2) destroy completely; 3) defeat



Fig.2. Profile of Destroy

Next, select COLLOCATES. Students can intuitively see that the collocations of destroy and damage can be divided into four categories (also see Figure 4,5): noun collocations,

See allace NOUN

See a

better understand destroy and damage.

Fig.3. Profile of Damage

adjective collocations, verb collocations and adverbial collocations.



Fig. 4. Collocates of Destroy(part)

Here just follows the concrete narration of adverbial collocations due to format limits. The teacher can guide students to observe and analyze the concordance lines and check the meanings of the collocated adverbs in the specific context to obtain the differences in the range of action caused by destroy and damage. The followings may be the students' findings under the guidance of their teacher. The collocated adverbs for destroy always means the greatest degree, such as completely, totally, nearly, ultimately, utterly...reflecting the greatest strength and degree of destruction while damage is embellished by the adverbs like badly, seriously, heavily. Just judging from the adverbs, students can easily differentiate these two words, understanding that the degree and strength of destruction



Fig. 5. Collocates of Damage(part)

caused by damage is inferior to that of destroy.

Through the search of destroy and damage in COCA, students will further deepen their understanding the discrimination of the synonyms. At the same time, the use of Corpus technology to teach language knowledge in reading texts is also conducive to avoiding the traditional teaching mode of separating vocabulary and text, which allows students to summarize the collocations of words from real examples instead of passively memorizing the collocations of words.

(3) Summary and Homework

After presentation, the class comes to an end by reviewing the background knowledge and related vocabulary expressions, drawing the text mind map to connect the structure of the article, and finally expanding the reading practice. During the extended reading phase, students can use the internet to search for the latest language resources related to the unit topic, such as the reactions of humans or animals before, during, and after the occurrence of other natural disasters such as tsunamis and mudflows. Then Ask students to record what they have surfed and write down the responses in a composition, which not only help students consolidate their established knowledge, but also help students open up a path of independent learning for searching, reading, thinking and writing.

IV. CONCLUSION

This paper, guided by the schema theory, explored a feasible reading teaching model in senior high school from the perspective of corpus linguistics. Obviously, corpusbased English reading teaching activities show how teachers should help students predict the theme of the text in the actual teaching process to develop their reading skills of predicting topics and grasping key information. At the same time, the corpus is used to exhibit the mass presentation of examples and highlight the key information to help students focus on teaching points such as vocabulary, grammar, motivating students to explore the rules of language use and enhancing their sensitivity to the real use of language. Moreover, corpus-assisted English reading teaching model follows the trend of the widespread application of modern electronic information technology in the era of information explosion. It is easy to resonate with teenagers and further stimulate students' interest in learning.

However, there are also some limitations in corpusbased reading teaching model. For example, the concordance line can only be used to roughly clarify the plot and obtain some important information; as for the rhetorical devices, author's attitude and other details, it still requires teacher to use the traditional teaching approach to guide students to explore. Hence More attention can be paid to making full use of the advantages and avoiding the disadvantages in the later teaching practice of combining corpus-based methods with traditional teaching approach in English reading teaching, and then this teaching model would greatly contribute to English reading teaching.

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