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“GLoCALL2023 学术年会暨 2023(第 19 届)语言智能教学国际会议”于 2023 年 8 月 10-12 日在呼和浩特市举办。会议由中国英汉语比较研究会语言智能教学专业委员会 (ChinaCALL) 主办,北京外国语大学网络教育学院和人工智能与人类语言重点实验室、内蒙古师范大学外国语学院联合承办, *Journal of China Computer-Assisted Language Learning* (JCCALL, 中文刊名《语言智能教学》) 期刊编辑部、《外语与外语教学》期刊编辑部、北京外研在线数字科技有限公司联合协办。本届会议由环太平洋地区计算机辅助外语教学协会 (PacCALL) 提供学术支持。会议内容分为会前工作坊、专家主旨发言、专题研讨、分会场发言以及学术圆桌论坛。大会将以深度互动、注重务实为特色,为探索新技术与外语教学的融合和发展提供相互交流、研讨、提高和合作的平台。

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Infinigo ChatIC as a Pedagogical Tool: An Analysis of Lexical and Syntactic Sophistication of L2 English Writing by Students, Self-Written or MT-Assisted

Abstract: ChatGPT has drawn rapid interest among linguists and language teachers, with academics and industries rushing to tap into its potential. Following the researches exploring the use of MT in language teaching and learning, this study aims at examining the effects of ChatGPT, specifically, one of its Chinese versions called infinigo ChatIC, in improving the quality of L2 writing and in facilitating the development of L2 proficiency among some postgraduate students learning a common English reading and writing course in a prestigious university in Southwest China. A set of 24 English writings are collected as part of regular homework assignments, then this set of English writing is polished by the teacher researcher in the infinigo ChatIC dialogue box with the prompt “please correct grammatical errors in the following English text so that it is grammatically accurate”. These two sets of writings are scored in iWrite automatic scoring system, and then analyzed in Lu & Ai’s web-interfaced linguistic complexity analyzer. The study finds that infinigo ChatIC can effectively improve the quality of L2 English writing, with lexical sophistication vastly improved, and yet surprisingly syntactic complexity level slightly reduced, pointing to a more nuanced understanding of syntactic complexity. Pedagogical implications are discussed.

Keywords: ChatGPT; L2 proficiency; linguistic complexity; pedagogical effects

1. Introduction

ChatGPT has drawn rapid interest among linguists and language teachers, with industries,

including language service, rushing to tap into its instrumental potentials. ChatGPT, or Generative Pre-trained Transformer (GPT) models, especially GPT 3, based on the Transformer Model created by Google in 2017, has been widely used in natural language processing, including language translation (Eke 2023). ChatGPT can produce human-like responses that are coherent and relevant to a variety of prompts, like questions and requests (Gilson et al., 2023; Pavlik, 2023). Compared to the traditional Machine Translation tools, it is widely assumed that ChatGPT can produce language translations that are more fluent, grammatically accurate and contextually appropriate. However, despite buzzes of tests and practices and seminars and workshops, few researches have been conducted to assess statistically and qualitatively whether and how ChatGPT-polished texts are better than students' self-written and MT-produced essays, particularly in terms of linguistic complexity. This study aims at providing quantitative and qualitative evidence for effective use of ChatGPT, in this case, infinigo ChatIC (<https://www.infinigo.com/chatIC>), which is a freely accessible and available version of ChatGPT in China, in the instruction of L2 English writing.

Linguistic complexity is a statistical construct correlated with L2 writing proficiency and the quality of L2 writing, acting as the indicators, diagnostics or proxies of the latter (Wolfe-Quintero et al., 1998; Ortega 2003; Ortega, 2012, P128). The basic assumptions of linguistic complexity include: (1) more is more complex, like more phonemes, inflectional forms or categories, grammatical derivations; (2) longer linguistic units are more complex; (3) more and/or more deeply embedded is more complex; (4) more varied or diverse is more complex. (5) more marked, infrequent, sophisticated, semantically abstract, costly, cognitively difficult or later acquired features are more complex (Bulté and Housen 2012).

In a lot of cases, lexical sophistication and syntactic complexity are examined. Research

evidences show that both lexical sophistication and syntactic complexity can strongly predict L2 proficiency and the quality of L2 writing, with lexical sophistication being an exceptionally strong predictor(e.g. Kim et al 2018). While lexical sophistication appears to be a straightforward concept, syntactic complexity is a multi-dimensional concept with each dimension requiring one or more different measures appropriate for that dimension(Bulté and Housen 2012; Lu, 2011; Norris and Ortega, 2009;Lu 2015), such as length of production unit(MLC, MLS, MLT), amount of subordination(C/T, CT/T, DC/C, DC/T), amount of coordination (CP/C, CP/T, T/S), degree of phrasal sophistication (CN/C,CN/T,VP/T), overall sentence complexity (C/S). It has been noted that some measures are stronger indicators of L2 writing proficiency than other measures (e.g., Ai & Lu 2013; Ortega, 2003; Norrby and Håkansson, 2007; Ortega, 2000; Lu, 2011; Vyatkina, 2013; Wolfe-Quintero et al 1998) while some other measures are strongly indicative of the quality of L2 writing(e.g. Lu & Ai 2015; Taguchi et al 2013; Yang et al 2015) and syntactic complexity differs among NS and NNS with different L1 backgrounds(Lu & Ai 2015). Not only syntactic complexity appears to be a complex concept made of different dimensions, which in their turn consist of different indices, but also it is found that taking socio-pragmatic adequacy into account, e.g.looking at native speakers' baseline data, after a certain point a decrease in syntactic complexity might be interpreted as a sign of higher proficiency (Pallotti,2009, pp. 598 – 599).

In light of the pedagogical usefulness of lexical and syntactic complexities, this study sets out to examine the effective use of ChatGPT(in this study infinigo ChatIC) in polishing L2 English writing by students, either self-written or MT-assisted, and thus through comparative analyses of such writings in terms of its lexical and syntactic sophistication, pointing to the specific language knowledge for students to learn, and also offering a huge opportunity for the students highly

driven to improve their writing by accessing ChatGPT anytime and where as they wish.

This study will focus on the following three research questions:

- (1) Do ChatGPT - polished students' L2 English writing score higher than their self-written and MT-produced texts in the automated scoring systems such as iWrite?
- (2) Do ChatGPT -polished students' L2 English writing score higher than their self-written and MT-produced texts in terms of lexical and syntactic complexity?
- (3) Can the use of ChatGPT facilitate L2 English writing instruction?

2.Method

2.1 participants

The participants are 24 postgraduate students pursuing a master's degree in a high-ranking university in Southwest China. To improve their L2 writing skills, the teacher and researcher assigns a writing task each week with a prompt differing from one week to the other. The study chose one week's essay writing as the research object, polish the 24 writings with ChatGPT, and then have them scored in iWrite to compare the differences in scores concerning different dimensions such as language, content, text structure and technicalities; and then have them analyzed via Prof. Lu Xiaofei's syntactic and lexical analyzers to get the statistics, again to compare the differences between the two sets of texts. Then based on the statistical findings, the study will explore how the teacher can use the results of comparative analysis for pedagogical purposes.

It should be noted that the writing assignment is not to write an essay in the typical sense, but to post a writing as a form of discussion about the same topic. Specifically, the students are

expected to express their view and then argue for it. Therefore, the writing is informal, with no requirement about the number of words used in the writing or strict requirements concerning text structure. Students are encouraged to use MT tools they are familiar with to assist their writing, and also to read parallel English texts for information.

2.2 Instruments

ChatGPT has a lot of models and iterations. The technology used in this study is infinigo ChatIC, one of the numerous Chinese versions of ChatGPT created by Chinese tech companies, which is the only one found freely available to the public. Infinigo ChatIC is an AI-powered chatbot platform driven by advanced NLP (Natural Language Processing) algorithms(<https://www.infinigo.com/chatIC>). It can generate human-like responses in both Chinese and English, so that it is equipped with grammar checking and language correction tools that can identify and correct errors in English text. The researcher has used infinigo ChatIC to polish the 24 L2 English writings by the postgraduate students in her university with the same prompt: Please revise the following English paragraph and make sure that it is grammatically correct. The results created by infinigo ChatIC are then copied and pasted into the iWrite system for scoring and evaluation for the purpose of comparing them with that students self-written or MT-assisted essays.

iWrite is an automatic English teaching and scoring system(<http://iwrite.unipus.cn>), designed by professor Liang Maocheng and his team for intelligent diagnosis of relevance and coherence of an English essay written by L2 English learners and offers immediate feedback on grammar and usage. iWrite serves as the official scoring system for FLTRP-ETIC Cup English

Writing Contest. It has won the championship in 2020 CGED. iWrite serves over 600,000 users and 1700 educational institutions in over 300 cities of more than 30 provinces. iWrite offers not only a global score in a hundred-mark system, but also specific scoring concerning the language, content, text structure and technical specification in a five-star system, as well as a score in terms of coherence and relevance in a hundred-mark system. It also diagnoses the text grammatically. The detailed data of both the sets of the English essay and their ChatGPT-polished versions are collected and analyzed to offer an insight into the potentials of inifigo ChatIC in L2 writing instruction.

To provide more statistical evidence as to the potential role of inifigo ChatIC in L2 writing instruction, Web-based Lexical Complexity Analyzer and Web-based L2 Syntactic Complexity Analyzer(<https://aihaiyang.com/software/>) are used to analyze the lexical and syntactic complexity of the two sets of texts under research in this study.

2.3 Study design

This is a cross-sectional study that is conducted in the natural learning process instead of under experimental conditions, as the latter may not be able to reflect the true situation and hence lack ecological validity(Van Lier, 2000, Van Lier, 2004). The 24 L2 English writing samples are produced under non-experimental conditions as part of the regular coursework.

3.Results

3.1 Statistics from iWrite Scoring & Related Case Studies

Table 1. Descriptive Data of the corpus used.

	Number essays	Total word count	Mean of essay length	Mean of iWrite global scoring
Self-written or MT-assisted	24	2558	106.58	65.375
ChatGPT-polished	24	2446	101.92	79.158
		↓ 4.38%	↓ 4.37%	↑ 17.4%

Table 1 indicates that ChatGPT-polished texts use slightly fewer words than students' self-written or MT-assisted writing, in sharp contrast to the rise of mean iWrite global scoring from 65.375 to 79.158, by 17.4%. The few number of words used might indicate the rise of lexical density via the process of nominalization, which in turn leads to the rise of the iWrite global scoring. This hypothesis is to be tested by more data in the text.

Table 2. iWrite scoring data

	Language (mean)	Content (mean)	Text Structure (mean)	Technicalities (mean)	Coherence (mean)	Relevance (mean)
Self-written or MT-assisted	3.354	4.021	2.396	4.042	95.625	89.782
ChatGPT-polished	4.396	4.417	2.583	4.5	96.75	93.167
	↑ 31.1%	↑ 9.8%	↑ 7.8%	↑ 11.3%	↑ 1.2%	↑ 3.8%

Table 2 shows that the Infinigo ChatIC-polished texts have risen in the iWrite scoring of all dimensions. The enhancement in language is most prominent(31.1%), with that in technicalities coming the second(11.3%), with the enhancement of coherence least prominent(up by 1.2%).

It is found that infinigo ChatIC excel in correcting language errors. Here is a typical example of students' writing enhanced by infinigo ChatIC.

I think genius is decided by gene and learning the day after tomorrow. Genius is innate , which is absolutely reasonable. There are some people are outstanding that they feel unreal in the world, for example, Picasso ' s achievements in painting art, Jordan ' s achievement in basketball and Michael ' Jackson ' s achievements in pop music. Their talents are definitely closely related to genetics, and they have inherited the top talents. However, the viewpoint that genius is acquired also makes sense. There are so many people who have achieved great success through their unremitting efforts. So we must acknowledge that some people rely on postnatal efforts to become more outstanding.(a student's writing, with punctuation errors retained.)

The above text showcases a typical student L2 writing which the student writer is completely disengaged from, a case that students write in the Chinese and have the Chinese text translated into English by MT, as an error could only be made by MT tools rather than humans, as shown in the following:

"I think genius is decided by gene and learning the day after tomorrow".

There is also a sentence that adopts the Chinese syntactic rule so that the readability is quite low:

"There are some people are outstanding that they feel unreal in the world, for example..."

Fortunately, the infinigo ChatIC-polished writing has eliminated the above errors;

furthermore, variations of words are used for the same meaning, as shown in the use of “pioneering work, unrivaled talent, and innovation” to substitute the single word “achievements”.

Here is the infinigo-polished version:

“My belief is that genius is determined by both genetics and learning. The innate talent is undoubtedly reasonable. There are individuals that appear otherworldly, such as Picasso’s pioneering work in painting, Jordan’s unrivaled talent in basketball, and Michael Jackson’s innovation in pop music.”

Besides the improvement of language, it is a bit interesting that although the enhancement of coherence shows least prominently in statistics(1.2%), it is very significant in a case analysis.

The following is a text written by a student, Cathy(Pseudonym):

I believe that genius is formed through nurture rather than nature.

Firstly, human intelligence is the result of the interaction between genes and the environment, but the difference in innate intelligence between individuals is not significant. This means that postnatal effort is crucial. Secondly, the term "genius" greatly diminishes the importance of people's postnatal effort and dedication, while exaggerating the significance of innate conditions, which can lead to misunderstandings. Finally, since our innate conditions are similar, I believe that through postnatal effort, practice, exploration, curiosity, and critical thinking, we can still shine and become geniuses in certain fields.(The underlines are added by the researcher.)

In contrast, the infinigo-ChatIC-polished text reads as follows:

I hold the belief that genius is mostly nurtured from postnatal care rather than innate qualities. For one, human intelligence is determined by complex interactions between genetics

and the environment, but the inheritance of native intelligence amongst individuals is not vastly different. Therefore, it is the efforts made after birth that shape our minds significantly. Furthermore, I believe that the term "genius" underestimates the significance of postnatal effort and hard work while exaggerating the relevance of innate conditions, potentially causing misconceptions. Ultimately, since our innate conditions are alike, I am of the opinion that with sufficient postnatal dedication, practice, curiosity, exploration, and critical thinking, we can all excel and become geniuses in our respective domains.(The underlines are added by the researcher)

The replacement of "firstly...secondly..finally" with "for one...furthermore...ultimately" is quite meaningful for EFL teachers to instruct students to learn advanced coherent and linking devices.

In another case study, the student's self-written text is effectively improved in terms of cohesion and coherence. The student's original text reads:

Genius, in my opinion, it means that someone shows strong learning and application ability in a certain field or multiple fields, and I think that these abilities require innate genetic inheritance. Generally speaking, the IQ above 140 is considered a genius. If the IQ score is too low or insufficient, it will not reach the level of learning and understanding about higher order knowledge. But if a genius doesn't learn new things, he can't do anything. (The underlines are added by the researcher.)

The infini-go-enhanced text, in contrast, has also enhanced the cohesion and coherence of the text although the prompt is just to revise the English text so that it conforms to the English grammar rules.

In my opinion, genius refers to someone who demonstrates exceptional learning and application abilities in one or more fields. I believe that these abilities are often innate and inherited genetically. Typically, an IQ score above 140 is considered indicative of genius-level intelligence. Conversely, if an individual's IQ score is too low or insufficient, they may struggle to comprehend and learn higher-order knowledge. However, even if someone is a genius, they must continue to learn and acquire new knowledge in order to apply their abilities effectively. (The underlines are added by the researcher.)

The comparison of the above two texts shows that the linking devices such as “typically...conversely...however” are quite instrumental for EFL teachers to highlight adequate and better linking devices in L2 writing instruction.

3.2 Qualitative Analysis of iWrite Comments on the Two Sets of Writings

Besides scoring, the iWrite platform provides comments on the quality of student writings.

The iWrite comments on the texts are coded artificially into 6 themes as follows.

Table 3. Six themes of the iWrite comments

Spelling

Sentences

Grammar and variety and richness of grammatical structures

Diversity and richness of vocabulary

Word count

Cohesive devices

The researcher has gathered all the 48 comments on the two sets of writings with 24 in each set and made a qualitative analysis. In terms of spelling, it is clear that all of the 48 texts, both students' self-written or MT-assisted writing and the ChatGPT-polished texts, are free of any errors, as all of them are commented as "the spelling is wonderful and free of any errors". Thanks to technological assistance, spelling is no longer a problem.

With regards to sentences, the comments show that with MT-assisted L2 English writing, fluency is easily attained, thus playing a lesser role in the global scoring of the texts. Specifically, "sentences are relatively smooth" (10 times, separately or with other comments) concerning texts with a complete range of global scores, including 91.3, 77.6, 64.7, 53.4, 78.3, 63.4, 43, 60.6, 67.7, 78.4, 76.1, 85.5. "Sentences are very fluent" (11 times, separately or with comments on phrasing) concerning texts with also a very wide range of global scoring, like 86.4, 84.4, 83.4, 80.2, 78.7, 79.4, 72.3, 67.9, 66.2. Alternatively, the comments contain the word "flowing" or "fluid", like "sentences are relatively flowing", or "sentences are very flowing". The comment "sentences are relatively flowing" is used for 13 times to describe texts with a whole range of global scoring, from 40.1 to 94.3. "sentences are very flowing" is used for 12 times to describe texts whose scores range from 53.1 to 88.1. This shows that with the assistance of MT tools, students' L2 writings show enhanced and even perfect proficiency on the sentence level, to the extent that well-constructed sentences may play a role in the global scoring of the writings, but the role would be fairly slight. Nonetheless, when ChatGPT-polished text is scored 80.9, in contrast with 64.7 of the student's original text, the comment does change from "sentences are relatively smooth" to "sentences are very flowing". In another case, when the ChatGPT-polished text scores

94.3, from 84.9 of the student's text, the comment changes from "sentences are relatively flowing" to "sentences are relatively flowing, with varied and rich syntactic structures." This change of comments applies to many of the texts in the study.

With regards to grammatical accuracy and variety and richness of grammatical structures, the comments include mostly "There are relatively few grammar errors, demonstrating a good understanding of grammar structures", which is used to describe the grammar of 22 texts; "Grammatical structures are accurate and there are no grammatical errors in the essay", used to describe 13 texts; "there are no grammatical errors in the essay, demonstrating a good understanding of grammar structures", used to describe 6 texts. "there are some grammatical errors, and revisions are recommended," used to describe 1 text. It is shown that the assistance of MT has eliminated most of the grammatical errors in the students' writing, thus unable to differentiate between texts of different scores. However, in one case where a rise of 21.8 points, the highest rise of scores among the 24 texts through infinigo ChatIC polishing, from 53.1 to 74.9, the comment on grammar is changed from "there are some grammatical errors, and revisions are recommended" to "there are no grammatical errors in the essay, demonstrating a good understanding of grammar structures". This points to the role that grammar plays in the global scoring of an English essay.

However, it is clear through the comments that with the assistance of infinigo ChatIC, one of the largest changes of scores occur due to variations and richness of vocabulary. 18 out of the 24 texts written by students with or without MT assistance are commented as follows: "Variations of vocabulary should be enhanced"; "Vocabulary should be more varied"; "the vocabulary is limited; and use of more advanced words and phrases is recommended." "The text does not show a good

grasp of advanced vocabulary.” “The text shows a rather limited vocabulary.” And with infinigo ChatIC-polishing, all of the 18 texts are commented as follows: “the vocabulary is varied” or the “the vocabulary is rich.” It shows that infinigo ChatIC, when instructed to correct grammatical errors, tends to improve the register of the words and phrases used.

Here is a typical case of enhanced vocabulary complexity mainly in the form of nominalization:

Version 1: I think genius is the result of the interaction between genes and environment. Essentially, the brain's capacity for intelligence depends on three factors: the number of nerve cells, how well they function, and the complexity of the connections between them. The number of nerve cells in each human brain is basically the same, which is the material basis of intelligence.

However, whether the function of nerve cells is normal and active, and whether the connections between nerve cells are rich or not depends on whether the brain is healthy, whether the nutrition of the brain is sufficient, whether the training is in place and so on.(a discussion draft written by a student with the help of MT)

With the polishing of Infinigo ChatIC, the above text reads as follows:

Version 2: My opinion is that the emergence of genius is the outcome of the interplay between genetics and environmental factors. Fundamentally, the brain's potential for intelligence relies on three factors: the quantity of nerve cells present, their effectiveness, and the complexity of their interlinking. The number of nerve cells in each person's brain is fundamentally similar, being the foundation of cognitive ability. Nonetheless, the functionality and activeness of nerve cells and the richness of their interconnections depend on the brain's overall health, sufficient

nutrients, proper training, among other things.

Table 4 Comparing vocabulary complexity of the above two texts (V1 & V2)

	Version 1	Version 2
Vocabulary complexity	I think	My opinion is
	genius	the emergence of genius
	Genes and environment	Genetics and environmental factors
	The number of	The quantity of
	How well they function	Their effectiveness
	However	Nonetheless
	whether the function of nerve cells is normal and active	<i>the functionality and activeness of nerve cells</i>
	<i>whether the connections between nerve cells are rich or not</i>	<i>the richness of their interconnections</i>
	<i>whether the brain is healthy</i>	<i>the brain's overall health</i>
	<i>whether the nutrition of the brain is sufficient</i>	<i>sufficient nutrients</i>
	<i>whether the training is in place</i>	<i>proper training</i>
	And so on	<i>among other things</i>

It is very intuitive for EFL teachers to instruct students to use this table to acquire in a very

detailed way about the complexity of vocabulary.

Based on a thorough study of the iWrite comments on the word count or length of the texts, it is found that infinigo ChatIC, under the prompt of revising the English text grammatically so that it is grammatically accurate, does not affect the length of the texts in any important way, mostly retaining the same length(20 out of 24 texts), in some cases slightly increasing and reducing the word count(4 out of 24 texts). Despite the rise of scores due to enhanced lexical and syntactic complexity and the elimination of grammatical errors and technical irregularities, terribly insufficient word count or text length leads to a low score. A text that contains 39 words is scored 48, although it reads almost perfect linguistically.

With regards to coherence, 18 out of the 24 students' self-written or TM-assisted writings and their infinigo ChatIC-polished versions are commented as "the use of transitional words is appropriate", or "the writing shows adept use of transitional techniques" or "the use of transitional words is effective". In four cases, the student's self-written or TM-assisted writings are commented as "transitional words should be used to enhance the structure of the writing" or "linking words should be used between sentences to improve the flow of the writing" while their infinigo ChatIC's polished versions are commented as "the use of transitional words is effective". This proves that infinigo ChatIC can enhance coherence of the writing. Nonetheless, in two cases, both of the students' writing and their polished versions lack linking devices.

3.3 Lexical Complexity Statistics from Professor Lu's Autonomous Analyzer

Then, to derive statistical evidence for the enhancement of vocabulary complexity in the infinigo ChatIC-polished texts, the researcher analyzed the lexical complexity of a total of 24 texts

written by students and their counterparts polished by infinigo ChatIC via Professor Lu Xiaofei's web-interfaced lexical complexity analyzer(Lu 2010; Lu 2011; Ai & Lu 2013; Lu & Ai 2015). The following is the result.

Table 5 Comparison of Lexical Complexity of the Texts by Students and Polished by Infinigo ChatIC

	LD	LS1	LS2	VS1	VS2	CVS 1	NDW Z	NDW Z	NDWE RZ	NDWE SZ
1	0.52	0.32	0.36	0.11	3.80	1.38	658	32	39.80	36.80
2	0.55	0.40	0.42	0.16	8.17	2.02	766	37	40.10	41.50
	↑5.8 %	↑25%	↑17%	↑45%	↑115%	↑46.3 %	↑16.4 %	↑15.6 %	↑0.75%	↑12.8%
	TTR	MSTT R	CTT R	RTT R	LOGTT R	UBE R	VV1	SVV1	CVV1	LV
1	0.25	0.75	9.09	12.85	0.82	19.47	0.44	58.19	5.39	0.42
2	0.27	0.80	10.20	14.43	0.84	21.04	0.49	79.29	6.30	0.44
	↑8%	↑6.7%	↑12.2 %	↑12.3 %	↑2.43%	↑8.06 %	↑11.4 %	↑36.3 %	↑16.9%	↑4.76%
	VV2	NV	ADJV	ADV V	MODV					
1	0.10	0.41	0.08	0.05	0.13					

2		0.40	0.10	0.05	0.15					
	0.10									
		↓2.44 %	↑25%		↑15.4%					

It is clear that all of the 25 indices of vocabulary complexity score higher in infinigo-ChatIC-polished texts except for verb variation II(VV2) and adverb variation(ADV), which remain the same, and for noun variation, which scores very slightly lower (0.40 down from 0.41)in ChatIC-polished texts. The most prominent enhancement is in corrected verb sophistication(46.3%). This finding is consistent with the qualitative analysis of the iWrite comments in 3.2.

As a text with over 1000 words cannot be analyzed through the web-interfaced syntactic complexity analyzer, the total of 24 texts and their infinigo counterparts are analyzed separately in three installments, with the first 7 texts, the second 9 texts, and the last 8 texts analyzed respectively. The hypothesis is that the changes of the indices of syntactic complexity are similar across different installments although they may not be consistent among themselves,thus carrying a potential to reveal a pattern of infinigo ChatIC polishing.

Table 6 Comparison of Complexity of Syntactic Structures of Texts Written by Students or Polished by Infinigo ChatIC (the first 7 texts)

	W	S	VP	C	T	DC	CT	CP	CN	MLS
1	844	47	115	102	60	42	31	22	111	17.957
										4

2	773	49	92	75	48	26	22	22	111	15.775
										5
	↓	↑	↓	↓	↓	↓	↓			↓
	MLT	MLC	C/S	VP/T	C/T	DC/C	DC/T	T/S	CT/T	CP/T
1	14.066	8.2745	2.1702	1.916	1.700	0.411	0.700	1.276	0.516	0.3667
	7			7	0	8	0	6	7	
2	16.104	10.306	1.5306	1.916	1.562	0.346	0.541	0.979	0.458	0.4583
	2	7		7	5	7	7	6	3	
	↑	↑	↓		↓	↓	↓	↓	↓	↑
	CP/C	CN/T	CN/C							
1	0.2157	1.8500	1.0882							
2	0.2933	2.3125	1.4800							
	↑	↑	↑							

Table 7 Comparison of Complexity of Syntactic Structures of Texts Written by Students or Polished by Infinigo ChatIC (the second 9 texts)

	W	S	VP	C	T	DC	CT	CP	CN	MLS
1	992	52	145	109	56	48	29	30	115	19.076
										9
2	978	54	139	105	54	47	34	34	131	18.111
										1
	↓	↑	↓	↓	↓	↓	↑	↑	↑	↓

	MLT	MLC	C/S	VP/T	C/T	DC/C	DC/T	T/S	CT/T	CP/T
1	17.714	9.1009	2.096	2.589	1.946	0.4404	0.8571	1.076	0.5179	0.5357
	3		2	3	4			9		
2	18.111	9.3143	1.944	2.574	1.944	0.4476	0.8704	1.000	0.6296	0.6296
	1		4	1	4			0		
	↑	↑	↓	↓	↓	↑	↑	↓	↑	↑
	CP/C	CN/T	CN/C							
1	0.2752	2.0536	1.0550							
2	0.3238	2.4259	1.2476							
	↑	↑	↑							

Table 8 Comparison of Complexity of Syntactic Structures of Texts Written by Students or Polished by Infinigo ChatIC (the last 8 texts)

	W	S	VP	C	T	DC	CT	CP	CN	MLS
1	785	52	113	94	48	44	29	20	97	15.096
										2
2	767	46	85	72	44	28	20	22	98	16.673
										9
	↓	↓	↓	↓	↓	↓	↓	↑	↑	↑
	MLT	MLC	C/S	VP/T	C/T	DC/C	DC/T	T/S	CT/T	CP/T
1	16.354	8.3511	1.807	2.3542	1.9583	0.4681	0.9167	0.9231	0.6042	0.4167
	2		7							

2	17.431	10.652	1.565	1.9318	1.6364	0.3889	0.6364	0.9565	0.4545	0.5000
	8	8	2							
	↑	↑	↓	↓	↓	↓	↓	↑	↓	↑
	CP/C	CN/T	CN/C							
1	0.2128	2.0208	1.0319							
2	0.3056	2.2273	1.3611							
	↑	↑	↑							

It is clear that the figures of some indices fall across all three installments, including word count(W), verb phrases(VP), clauses(C), T-unit(T), dependent clause (DC), clause per sentence(C/S), clause per T-unit(C/T), and those of some indices fall across two installments, including complex T-unit ratio, T-unit per sentence(T/S), dependent clause per T-unit(DC/T), dependent clause per clause(DC/C), verb-phrase per T-unit, and mean length of sentence (MLS) and also complex T-unit(CT), totaling 14 indices.

In contrast, the data of some indices rise across all three installments, including complex nominal per clause(CN/C), complex nominal per T-unit(CN/T), coordinate phrase per clause(CP/C), coordinate phrase per T-unit(CP/T), mean length of clause(MLC), mean length of T-unit(MLT), and the data of some indices rise across two installments, including complex nominal(CN) and coordinate phrase(CP) and sentences, a total of 9 indices.

Generally speaking, the syntactic complexity falls with the polishing of infinigo ChatIC, with mostly the number of clauses and verb phrases and T-unit and mean length of sentence falling, in contrast to the increase of nominals, coordinate phrases, mean length of clauses and number of

sentences.

The result is, in a student's words, "*The polished article has significantly improved its grammar by modifying long and complex sentences into more concise ones, splitting and recombining sentences to condense their meaning, and avoiding fragmented and cluttered sentences. The use of simplified sentences makes the article more accessible and easier to understand.*" The above data collected from professor Lu's syntactic complexity autonomous analyzer provides statistical evidence for students' intuitive feelings.

This pattern of infinigo ChatIC polishing of English texts, specifically, *reducing* clauses, verb phrases, T-units and shortening sentences and *adding* nominals, coordinate phrases and extending clauses provides new evidence to the research finding by Lu & Ai (2015) that the relationship of syntactic complexity in L2 writing to L2 proficiency might not be so straightforward as previously considered. One of the reasons is that there might be a L1 transfer effect in L2 writing in terms of syntactic complexity (Lu & Ai 2015). For example, despite the previous claim that greater use of coordinate sentences indicates beginning or lower levels of L2 proficiency (Bardovi-Harlig, 1992; Norris and Ortega, 2009), the L2 English writing by Chinese students, scored as the lowest level of proficiency among the 7 NNS groups in a study conducted by Lu & Ai in 2015, was found to contain significantly less syntactic coordination than the NS group. This may be explained by a L1 transfer effect, i.e. that in Chinese independent clauses are linked through punctuation instead of coordinating conjunction (Lu & Ai 2015). As a result, when infinigo ChatIC polishes the text, it tends to add coordinate phrases.

3.4 Pedagogical Implications

The use of inifinigo ChatIC yields great insights into the language knowledge that the L2 student writers need to acquire in order to improve their proficiency and accordingly the quality of their L2 writing, which is very helpful for EFL teachers. Furthermore, the use of ChatGPT can be encouraged among students to improve the quality of their writing and in this process enhance their L2 writing proficiency. In the study, the prompt is limited to having grammatical errors corrected, however, it is just a step away for EFL teachers and for students to give more varied prompts to ChatGPT, whatever versions mostly commonly seen in the world, to provide ideal language samples and to enhance students' writing, and to give instructions on how to improve L2 English writing. The teacher researcher has assigned a homework requiring students to combine Pigai, iWrite, and ChatGPT to correct grammatical errors, and to enhance their writing and then present a study report on the improvement of the writing as shown by Pigai or iWrite automatic scoring system, and what they have learned in this process. The reports submitted by students show that the combined use of pigai, iWrite and ChatGPT has dramatically improved the quality of their writings. In the best case, a student has successfully improved the score of his writing from 69 to 91.5. In addition, by comparing their original writing with the polished version, the students learn in a very intuitive and vivid way what a good English essay looks like and where they can improve.

4. Conclusion

In concluding, the three research questions have been answered.

First, ChatGPT- polished students' L2 English writing score significantly higher than their self-written and MT-produced texts in the automated scoring systems such as iWrite.

Second, ChatGPT-polished students' L2 English writing score significantly higher than their self-written and MT-produced texts in terms of lexical complexity and in some measures of syntactic complexity, specifically nominals, coordinate phrases, mean length of clauses and number of sentences. This finding provides evidence to the assertion of Pallotti(2009) that past a certain point, the increase of syntactic complexity may point to a lower level of language proficiency and Lu & Ai's 2015 finding of L1 transfer effects on L2 writing.

Third, the use of ChatGPT can facilitate L2 English writing instruction by providing insights to the language knowledge and essay writing skills that the students may need to improve their L2 writing, both for EFL teachers and for the students themselves.

The current study is also significant as it may point to a new gap in the extant literature concerning the L1 transfer effects on L2 writing, specifically shown in the use of verb phrases(VP), clauses(C), T-unit(T), dependent clause (DC) as well as nominals and coordination as more researches are needed with the advent of ChatGPT and other new technologies.

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An Appraisal Analysis of Chinese and Foreign Teachers' Attitude in University English Classroom Discourse

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Abstract: Attitudes of teacher talk strongly affect the interpersonal relationships between teachers and students. Drawing upon Appraisal Theory, the study attempts to explore the Chinese and English teachers' attitude in university English classroom discourse. Based on the self-built corpus, the study annotates and investigates the three subsystems of Attitude of Appraisal Theory: Affect, Judgement and Appreciation in Chinese and Foreign teachers' talks in university English class in China. Results show both Chinese and foreign teachers' attitudes are rich in classroom discourse. All the attitudinal resources were found in both Chinese and foreign university English classroom discourse. Foreign teachers' attitudinal devices are more expressive and productive than Chinese teachers' in university English class. (1) In the lower grade English majors' class, Chinese teachers' attitudinal devices are: Affect>Judgement>Appreciation. In the higher grade English majors' classes, Chinese teachers' attitudinal resources are: Appreciation>Affect>Judgement. In English majors' classes, Chinese teachers' attitudinal resources are: Affect>Judgement>Appreciation. However, in non-English majors' classes, Chinese teachers' attitudinal resources are: Affect>Appreciation>Judgement; (2) For foreign teachers' online class, foreign teachers' attitudinal resources are: Affect>Judgement>Appreciation; in off-line class, foreign teachers' attitudinal resources are: Affect>Appreciation>Judgement; (3) In foreign teachers' talk, except the Capability of Judgement, the frequencies of all the other subcategories of Affect, Judgement, or Appreciation, are overused than those of Chinese teachers, reflecting the full and powerful expression of Attitude by foreign teachers in classroom discourse. Both Chinese and foreign teachers expressed positive rather than negative attitudes in their own class, but foreign teachers' attitudes are richer and more expressive. The study provides implications for the English teachers' professional development in China.

Key words: appraisal theory; attitudinal resources, classroom discourse

1. Introduction

English, as a foreign language, is one of the compulsory subjects in university curriculum in China. Classroom is the major place for students to be regularly and frequently exposed to the target language. Classroom discourse refers to conversation or communication in educational settings. As the main medium for knowledge transmission, knowledge acquisition and knowledge construction, classroom discourse, to a large extent, determines what and how students learn (Walsh 2011). Teacher talk, an essential part of classroom discourse, is the variety of language sometimes used by teachers when they are in the process of teaching (Richard 2002).

In English language classes, an important resource available to teachers and students with which to achieve learning goal is 'language' (Christie, 2000: 184). As an important way to impart

knowledge to learners and a crucial means to control learners' behavior (Allwright & Bailey 1991), teacher talk can define whether a class will succeed or not (Cook 2000: 144).

In the university English class, no matter the English teachers are the Chinese teachers or the foreign teachers, their opportunities to express their thoughts, opinions and attitudes can reflect the value system of their personalities, building and maintaining the interlocutors' relationships and organizing the discourse (Hunston & Thompson, 2000). The appraisal framework, proposed by Martin and White (2005), is "a theory of the language of evaluation, developed within the tradition of systemic functional linguistic" (Read, Hope & Carroll 2007) and "is one of three major discourse semantic resources construing interpersonal meaning" (Martin & White 2005: 34). According to Martin & White (2005: 2), the teacher's attitudinal evaluations reveal their feelings and values, can be related to the teacher's status as construed by the classroom discourse, and operate rhetorically to construct relations of alignment and rapport between the teacher and actual or potential respondents. The way teachers talk to students affects how students learn and how students feel about themselves as learners and members of the classroom community. Teachers' ability to produce these attitudinal talks appropriately plays a crucial role in creating an effective, enjoyable and engaging environment for learning where the students can feel motivated and interested to participate in classroom interaction. While a vibrant body of research emphasizes the importance of teacher talk, few studies investigated teachers' attitude from the perspective of appraisal theory. Earlier studies of the teacher's attitudes relied mainly upon data obtained from questionnaires (Nicaise 2021).

To understand increasingly how Chinese and foreign teachers' attitudes are represented in university English Classroom Discourse in China, the present study aims to answer the following research questions from the appraisal analysis of the teacher's talk:

(1) How are the Chinese teacher's attitudes represented in university English classroom discourse?

(2) How are the Foreign teacher's attitudes represented in university English classroom discourse?

(3) What language choices did the Chinese and Foreign teachers make to convey attitudes in university English classroom discourse?

2. Literature Review

2.1 Previous Studies on Classroom Discourse

Classroom discourse analysis can be roughly classified into three stages. (1) From 1960s to 1980s, much research focused on the classroom interaction and the teacher's questions, recasts, feedback, strategies, turn-taking etc. (Chaudron 1988). (2) In the 1990s, many studies analysed the classroom discourse genres, relationships between society and classroom discourse, education reform and intertextuality of classroom discourse analysis as well as the quality and quantity of classroom discourse (Thornbury 1996). (3) Entering 21st century, scholars started to adopt more perspectives, frameworks or methods in classroom discourse studies. On the one hand, microethnography, sociolinguistics, multi-framework, multi-methods, critical questions, comprehensive perspectives of multi-methodologies were conducted in the relevant research. Complicated theory, socio-cultural theory etc are the new resources for the classroom discourse

analysis. On the other hand, a corpus offers a powerful methodological tool for classroom research. The corpus-based “discourse analysis, conversation analysis and sociocultural theory” studies rise day by day. Language identity, language socialization and many second language acquisition models have been applied (O’Keeffe *et al.* 2007: 244). Biber *et al* and Hong have built classroom discourse corpora respectively, providing the solid evidence for classroom practice and large-scale education reform in America and Singapore (Biber *et al.* 2006; Doyle 2009). In China, scholars have built the classroom discourse corpus as well, however, the existing corpora mainly focus on the secondary school English classes (Liu 2010; He 2011). The university English classroom discourse corpus remains tenuous up till now. Questionnaire, schemes or case studies are the frequently used method in classroom discourse analysis.

2.2 Attitude in Appraisal Theory

Appraisal theory, first advanced by Martin, and then developed by Martin and White, is “concerned with evaluation: the kinds of attitudes that are negotiated in a text, the strength of the feelings involved and the ways in which values are sourced and readers aligned.” (Martin & Rose, 2007: 25). It provides a way to categorize interpersonal meanings. The appraisal framework includes three semantic areas, Attitude, Graduation and Engagement.

The focus of the study is the attitudinal resources in the Appraisal Theory. Attitude is the core of appraisal system. It is concerned with people’s feelings and their character and evaluation of things. Attitude has three main types: Affect (people’s feelings), Judgement (people’s character) and Appreciation (the value of things) (Martin & Rose 2007: 29). The Attitude system includes (Zhu 2023: 1115):

- 1) Attitude can be either positive or negative.
- 2) Attitudinal meanings are situated along a sliding scale of force or intensity from low to high.
- 3) Attitude can be either implicitly or explicitly conveyed.
- 4) Attitude is culture-oriented and linked to readers’ ideological orientation.

Since attitudinal resources in the teachers’ talks may be used consciously and unconsciously according to the teaching content, the classroom activities and students’ performance etc. from teacher to teacher in different classes. Thus, the current study was entitled *An Appraisal Analysis of Chinese and Foreign Teachers’ Attitude in University English Classroom Discourse* rather than the attitudinal resources used in Chinese and Foreign Teachers’ Talks or the other similar ones.

2.3 Previous Studies on Classroom Discourse by Using Appraisal Theory

The Appraisal Theory enables researchers to conduct fuller investigation into the teacher’s attitudes, opinions and points. However, up to now, only a few researchers have analysed evaluative language through appraisal framework in classroom contexts. The research in evaluative language in teachers’ talks, in students’ oral presentations and in teacher-student interaction (Badklang & Srinon 2018; Rahayu, 2020; Aenida *et al.* 2022) were conducted, covering EFL (English as a Foreign Language) and CSL (Chinese as a Second Language) classrooms (Chin *et al* 2017); involving off-line and online classrooms and embracing primary, secondary and tertiary classrooms in Indonesia, Malaysia, Thailand and China (Shen Yingwen & Wang Jian 2016; Badklang & Srinon 2018; Rahayu, 2020; Aenida *et al.* 2022; Sultana &

Kuswoyo 2023; Zhu, 2023).

Some scholars are interested in the attitudinal resources in the teacher talk. (1) Chin *et al* (2017) examined how attitudinal resources in teachers' talk help to build teacher-student rapport in CSL classrooms in selected schools in Malaysia. The self-built corpus consisted of recording and observation of four teachers' CSL classrooms in four national primary schools. The size of the corpus was 17,189 words. Analysis showed that attitudinal resources realise rapport through teachers' acts of providing encouragement, giving positive feedback, facilitating face-saving and in promoting students' self-esteem during classroom teaching. (2) Zhu (2023) explored attitudes in teacher talk in EFL Classroom from the perspective of Appraisal Theory. Video recordings of ten college spoken English lectures in five college English teachers classrooms were transcribed and analysed. Each lecture had two sessions, lasting 90 minutes. The self-built corpus had 10,445 tokens, 1,896 types, 1,782 lemmas. Results showed that Attitudes are widely distributed in teachers' talks: Affect < Judgement < Appreciation. Affect resources are used by the teachers to talk about their own feelings and opinions; Judgement resources are used to evaluate students' abilities and personality traits; Appreciation resources are used to evaluate students' performance and the teaching materials. Teachers use resources related to positive attitude to explicitly commend students and resources related to negative attitude to gently or implicitly admonish them. (3) Shen & Wang (2016) concerned one specific subcategory of attitudinal resources in one specific composition of teacher talk. They analysed the Appreciation in teacher feedback in two experienced English classrooms in China. Videos of 10 advanced reading classes for junior English majors were selected and transcribed. Each class lasted 45 to 50 minutes. The topics of the articles included history, literature, language, culture, celebrities etc, and thereby could exert influences on the use of Appreciation resources in teachers' feedback. Words, phrases and clauses with Appreciation resources in teachers' feedback were collected and classified for the quantitative and qualitative analysis. Flanders Interaction Analysis System and classroom discourse analysis were used respectively to analyse the impact of feedback with Appreciation in IRF. Results indicated that Appreciation resources play a role in pushing student's output and maintaining effective classroom interaction.

Some scholars prefer to study attitudinal resources in EFL university classroom discourse, including both teachers' talk and students' talk. (1) Badklang & Srinon (2018) presented the analysis of the classroom discourse of a Muslim male teacher and 32 undergraduates from an English language for communication and learning class in a university in Thailand. The study investigated the attitudinal resources within the classroom talk, especially while the teacher and students were interacting and expressing their attitudinal meanings. The findings showed that the teacher and students passed on all three kinds of attitudes, Judgement, Appreciation, and Affect. Both teachers and students held positive rather than negative attitudes which conformed to the literature and the appraisal framework. The analysis also illustrated how the classroom relationships between the teacher and students were constructed. (2) Aenida *et al* (2022) concentrated on the attitudinal analysis of student-teacher talk on online classroom interaction through appraisal framework. Critical discourse analysis was adopted for the description as well. The study involved an English lecturer and students in the 5th semester in an Indonesia university. Data was taken during 2 hours of the learning process for 3 weeks. The findings showed that the

dominant attitude device found by students is Judgement > Appreciation>Affect. The dominant attitude device found by the teacher is Affect>Appreciation>Judgement. The way teachers and students described their emotional reactions showed their aspects and their relationships through the choice of language. The contribution of student and teacher talk in terms of appraisal analysis were; a sense of curiosity, sense of communicative, sense of responsibility, sense of respect for achievement, sense of honesty, and sense of independent. (3) Rahayu (2020) investigated an attitudinal system of teacher's talk in EFL classroom interaction in a secondary school in Indonesia. Critical discourse analysis was also adopted. This study included an English teacher and one science class of 11th grade students in a secondary school in Indonesia. The research found that the dominant type of attitudinal system conveyed by the teacher was Affect. It indicated that the teacher frequently expressed his opinion, feeling and emotion through their talk. These talks were mostly expressed in positive way. It indicated that the teacher always tried to build a positive atmosphere through positive talks in order to stimulate the students to become active in the classroom.

From the above, the appraisal analysis of classroom discourse is rarely conducted. The existing studies employed qualitative more than quantitative methods; or surveyed nonnative English teachers' attitude rather than native English teachers' attitude in EFL classroom discourse. Besides, since the the number of classroom discourse corpus is scarce, not much research has been carried out on the careful analysis of the word choice in attitudinal resources in teachers' talks. Universality and applicability of the results, in a great degree, are restrained by the size of the data in the previous studies.

3. Methodology

3.1 Corpus Description

The present study is based on two self-built classroom discourse corpora. One is HJL-EGPCDC. The other is FT-EFL-CDC.

3.1.1 Corpus Description of HJL-EGPCDC and the Data in the Present Study

(1) Corpus Description of HJL-EGPCDC

HJL-EGPCDC (Heilongjiang, Jilin, Liaoning-English for General Purposes Classroom Discourse Corpus) is a self-built corpus from 2011 till now. These data were collected the three provinces of Northeast China: Heilongjiang, Jilin and Liaoning Province, focusing purely on English classes within the participating universities: Intensive Classes from English Majors in the lower grade, Advanced English from English Majors in the higher grade, and General English Classes from those in non-English majors. The corpus of 48 teachers' EGP classroom transcripts created from the total 11, 890 minutes' (198.2 hours') recordings of lessons from the first, second year and third year of the universities from September, 2011 to December, 2022.

The recordings were part of my research projects and the extended empirical study from the dialogic classroom theory construction in my doctoral research (Tan, 2012). All the recordings were taken in the natural EGP classes, i.e. offline classrooms. Only one teacher's partly classroom recordings were taken online during the epidemic period in 2022.

The teachers' classroom recordings were collected purposefully to vary levels of universities, two teachers are from two 985 project universities, three are from a 211 project university, one is

from non-government university and all the others from the common provincial universities. The average age of the teachers is 34.6 and all of them got MA degree. The average teaching experience of the 48 teachers is 10 years. After excluding the Chinese, English in HJL-EGPCDC is roughly about 14, 540 types, 815, 858 tokens.

(2) The Data in the Present Study

In the present study, ten Chinese teachers' transcripts in university English classes were taken from HJL-EGPCDC. In the present study, after excluding the Chinese, the size of the corpus in the present study is roughly about 7, 248 types, 217, 901 tokens. Table 3.1 introduces the basic information of the course and the teachers. Five teachers gave classes in non-English majors classes, and the other five conducted classes in English majors.

Table 3.1 Basic Information of Chinese Teachers and Their Class Discourse

No.	File Name	Date of Recording	Duration of Recording	Teachers' Age	Length of Teaching	University Type
1	JC201E2FZ	2011.06	119 Minutes	41	4	Provincial
2	HH203E1FL	2022.03	394 Minutes 12 Seconds	41	15	Provincial
3	JC114E2ML	2014.10	149 Minutes 24 Seconds	43	11	211
4	HH207N1FLY	2015.12	114Minutes 15Seconds	23	0.25	Provincial
5	HH207E2MW	2018.04	454 Minutes	33	3	Provincial
6	JS217E3FJY	2017.09	453 Minutes 15 Seconds	46	18	Provincial
7	HH207N1FW	2015.12	140 Minutes 8 Seconds	46	14	Provincial
8	JC104N1MX	2015.12	175 Minutes 40 Seconds	52	21	985
9	HH312N2FB	2017.06	244 Minutes 29 Seconds	43	13	non-government university
10	LD119N1FL	2022.11	196 Minutes 34 Seconds	50	26	985
			Total Duration of Recording: 40 hours 40 Minutes 57 Seconds	Average Age: 41.8	Average Length of Teaching : 12.5	

3.1.2 Corpus Description of FT-EFL-CDC

Five teachers' transcripts in university English classes were taken from FT-EFL-CDC (Foreign Teachers EFL Classroom Discourse Corpus). Recordings were taken in foreign teachers' university classes without any interference. Some were in the offline classes, some others were in the online classes (including teacher-students' real interactions), some were the online recorded

video classes (without teacher-students' virtual interaction). For the offline classes, we got the foreign teachers' permit; for the online classes, we obtained the foreign teachers' permit or the director's permit.

Table 3.2 introduces the basic information of the course and the teachers in the present study. Three teachers gave classes in the offline spoken English classes, and two conducted recorded video classes. One teacher was in the English speech class, and the other two were in the English writing class. Three teachers in offline class are from U.S.A. The age of three teachers in offline class is 31.7, the teaching experience of three teachers in offline class is 2 years. The two online class teachers' nationality and other personal information were unknown. The duration of all the 5 foreign teachers' classroom recordings was 2, 152 minutes 44 seconds (35 Hours 52 Minutes 44Seconds), The size of FT-EFL-CDC in the present study is roughly about 7, 118 types, 208, 249 tokens.

Table 3.2 Basic Information of Foreign Teachers and Their Class Discourse

No.	Teachers' Name	Course Name	Nationality of the Teacher	Date of Recording	Duration of Recording	Teachers' Age	Length of Teaching	University Type	Offline (Y/N)
1	LD11E1MJE (Male)	Spoken English	U.S.A	2019.11-12	438 Minutes 13 Seconds	42	0	985	Y
2	LD11E1FJU (Female)	Spoken English	U.S.A	2019.9-12	466 Minutes 58 Seconds	26	1	985	Y
3	LD11N1MVI (Male)	Spoken English	U.S.A	2019.5-6	447 Minutes 29 Seconds	27	5	985	Y
4	JS217E2MPA (Male)	English Speech	Unknown	2022.9-12	603 Minutes 30 Seconds	Unknown	Unknown	Provincial	N
5	JS217E2MLY (Female)	English Writing	Unknown	2022.10-12	196 Minutes 34 Second	Unknown	Unknown	Provincial	N

3.2 Research Procedure

The research procedure of the present study is as follows:

Step 1: Choose the transcripts from the two self-built university classroom discourse corpora.

Step 2: Analyze and code the Chinese and English teachers' talks in the classroom discourse transcripts from the perspective of the Attitude Domain in the Appraisal framework.

Step 3: Calculate and analyze the data to determine the dominant type of attitudes and classify the contribution of teacher talk producing an education character in the university English class.

4. Results and Discussion

The findings show that the teacher and students expressed all three kinds of Attitudes, Affect, Judgement and Appreciation. Both Chinese teachers and foreign teachers expressed positive rather than negative attitudes which conform to the literature and the appraisal framework.

4.1 Chinese Teachers' Attitude in University English Classroom Discourse

4.1.1. Teachers' Attitude in English Classes of Lower Grade and Higher Grade

Results show (1) Both Chinese and foreign teachers' talks are rich in attitudinal resources, in English majors' class, in the lower grade, Affect (Frequency=1200, Proportion=59.58%) accounts for the largest proportion, followed by Judgement (Frequency=496, Proportion=24.63%) and

Appreciation (Frequency=318, Proportion=15.79%). In the higher grade, Appreciation (Frequency=858, Proportion=47.75%) accounts for the largest proportion, followed by Affect (Frequency=497, Proportion=27.66%) and Judgement (Frequency=442, Proportion=24.60%).

For the teachers' attitudes in English majors classroom discourse between lower grade and higher grade, further analysis shows (2) When Chinese teachers teach English majors of the lower grade, teachers' attitudes of safety, satisfaction and happiness are more than that of inclination in university English classroom discourse. Teachers would like to leave the students with the positive feeling for the friendly classroom atmosphere in lower grade. For example,

Excerpt 1

<014><Teacher>This way have a very <happiness>happy</happiness> effect on my army. (JC201E2FZ2)

Excerpt 2

<228><Female Teacher>The topic of this unit I think is very<reaction> interesting</reaction>. (HH207N1FLY1)

Excerpt 3

<301><Female Teacher>When you just get something, when you just get something especially<reaction> exciting</reaction>, or <reaction>successful</reaction>, and then you can be, can be recharged, to get more things back. (JS217E3FJY2)

(3) Facing the English majors in the lower grade, Chinese teachers spend more time on social norms. Thus, normality resources were overused in teachers' talk in the lower grade of English majors. Such as,

Excerpt 4

<138><Male Teacher> It's more<normality> frequently</normality> used. (JC114E2ML1)

Excerpt 5

<230><Teacher> It's off the<normality> usual</normality> path, off the usual path. (JC201E2FZ2)

Propriety is overused, displaying the teachers care more about the propriety of the classroom input in the lower grade of English majors. For example,

Excerpt 6

<270><Female Teacher> Sit down, <propriety>please</propriety>. (HH203E1FL2)

Excerpt 7

<116><Male Teacher> I'm <propriety>sorry</propriety>. It should be improper human behaviors, right? (JC114E2ML1)

(4) On the contrary, the teachers lack the attitudes towards the comment on things and phenomena, because three subcategories of Appreciation are all underused in the lower university English classroom discourse.

Table 4.1 Difference of Teachers' Attitudinal Resources between Lower and Higher Grade Classroom Discourse

Categories and Subcategories		Frequencies in Lower Grade	Frequencies in Higher Grade	Loglikelihood	Overuse/Underuse
Affect	inclination	102	172	-74.12	underuse
	safety	248	86	+3.50	overuse
	satisfaction	640	186	+25.58	overuse
	happiness	210	53	+14.07	overuse

Judgement	capability	150	168	-69.08	underuse
	tenacity	68	36	-0.86	underuse
	normality	92	34	+0.70	overuse
	veracity	98	180	-138.99	underuse
	propriety	88	24	+4.54	overuse
Appreciation	reaction	158	698	-958.59	underuse
	composition	110	80	-11.64	underuse
	valuation	50	80	-53.58	underuse

* $p < 0.05$, critical value=3.84

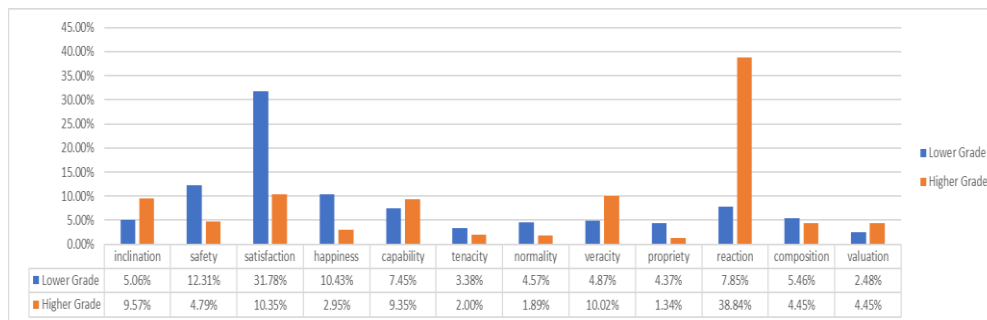


Figure 4.1 Chinese Teachers' Attitudinal Resources in English Majors Lower and Upper Grade Classroom Discourse

4.1.2. Teachers' Attitude in English Majors' Classes and Non-English Majors' Classes

(1) Chinese Teachers' Attitudinal Resources in English Major and Non-English Major Classroom Discourse

As Table 4.2 shows, in the English majors class, teachers' attitudes are Affect > Judgement > Appreciation; in the non-English majors class, Affect > Appreciation > Judgement.

Table 4.2 Chinese Teachers' Attitudinal Resources in English Major and Non-English Major Classroom Discourse

Majors	Categories and Subcategories	Frequencies of Subcategories	Frequencies of Categories	Proportion	
Non-English Major Classroom Discourse	Affect	inclination	200	1170	46.01%
		safety	246		
		satisfaction	515		
		happiness	209		
	Judgement	capability	300	666	26.19%
		tenacity	64		
		normality	74		
		veracity	82		
		propriety	146		
	Appreciation	reaction	550	707	27.80%
composition		81			
valuation		76			
English Major	Affect	inclination	274	1697	48.53%
		safety	334		

Classroom Discourse		satisfaction	826		
		happiness	263		
	Judgement	capability	318	938	26.82%
		tenacity	104		
		normality	126		
		veracity	278		
		propriety	112		
	Appreciation	reaction	542	862	24.65%
		composition	190		
		valuation	130		

(2) Difference of Chinese Teachers' Attitudinal Resources between English and Non-English Majors Classroom Discourse

As far as English majors and non-English majors are concerned, teachers' attitudes in the two types classroom discourse are evidently different as follows: (1) Facing the non-English majors, as Table 4.3 shows, teachers' attitudes exhibited feelings more frequently, because all the subcategories of Affect are overused in the English majors classroom; (2) By the observation of the corpus, teachers in English majors' classroom emphasized the veracity of things, this may due to the requirement of the students' professionalization of English as the major. Such as Excerpt 8 and Excerpt 9:

Excerpt 8

<149><Female Teacher>And <veracity>actually</veracity> bacon and egg is typical breakfast in England, bacon and egg. (JC201E2FZ1)

Excerpt 9

<162><Male Teacher>I'd like to say paragraph ten to nineteen, ah about the <((Stutter)) >the interaction between man and nature and, ah, say the way we did now is wrong and twenty to twenty-three now about the <veracity>real</veracity> problems of insects. (JC114E2ML2)

Table 4.3 Difference of Chinese Teachers' Attitudinal Resources between English and Non-English Majors Classroom Discourse

Categories and Subcategories		Frequencies in English Major Teachers' Talk	Frequencies in Non-English Major Teachers' Talk	Loglikelihood	Overuse/ Underuse
Affect	inclination	274	200	-86.04	Underuse
	safety	334	246	-107.57	Underuse
	satisfaction	826	515	-160.31	Underuse
	happiness	263	209	-104.15	Underuse
Judgement	capability	318	300	-192.59	Underuse
	tenacity	104	64	-19.32	Underuse
	normality	126	74	-19.93	Underuse
	veracity	278	82	+0.01	Overuse
	propriety	112	146	-134.94	Underuse
Appreciation	reaction	542	550	-387.63	Underuse
	composition	190	81	-6.92	Underuse

	valuation	130	76	-20.23	Underuse
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* $p < 0.05$, critical value=3.84

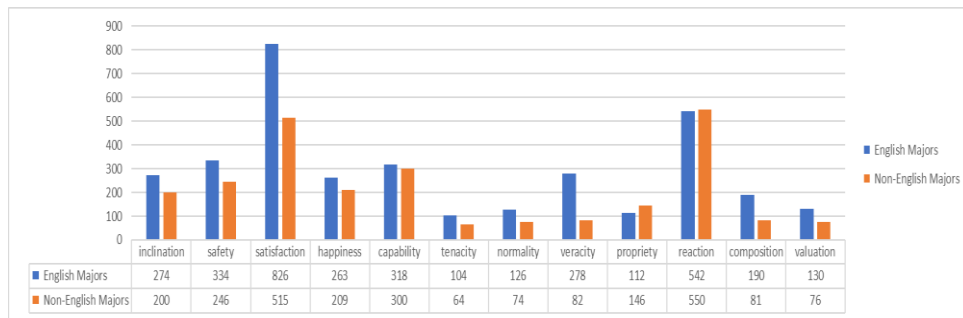


Figure 4.2 Chinese Teachers' Attitudinal Resources in English Majors and Non-English Majors Classroom Discourse

(3) Teachers in English majors classrooms lacked the attitudes towards the comment on things and phenomena, because the reaction, composition and valuation subcategories of Appreciation are all underused as Table 4.3 shows.

4.2 Foreign Teachers' Attitude in University English Classroom Discourse

As Table 4.4 shows, Attitudinal resources are widely present in foreign teachers' English teaching in universities. In online teaching, the proportion of Affect>Judgement>Appreciation; in off-line teaching, Affect>Appreciation>Judgement.

Table 4.4 Foreign Teachers' Attitudinal Resources Distribution in On-line and Off-line Classroom Discourse

Online/Offline	Categories and Subcategories	Frequencies of Subcategory	Frequencies	Proportion	
Online Courses	Affect	inclination	1, 314	3271	41.68%
		safety	703		
		satisfaction	917		
		happiness	337		
	Judgement	capability	291	3131	39.90%
		tenacity	728		
		normality	1, 410		
		veracity	414		
		propriety	288		
	Appreciation	reaction	334	1446	18.43%
composition		670			
valuation		442			
Offline Courses	Affect	inclination	408	1905	42.47%
		safety	565		
		satisfaction	800		
		happiness	132		
	Judgement	capability	146	1060	23.63%
		tenacity	146		
		normality	314		
		veracity	222		
	propriety	232			

	Appreciation	reaction	1, 203	1521	33.91%
		composition	160		
		valuation	158		

As Table 4.5 presents, further study shows that when foreign teachers gave lectures online, their attitudes of Affect, Judgement and Appreciation seem to be all overused in online class than those of offline class, except the reaction subcategory of Appreciation. Foreign teachers heightened their feelings in online classes, because all the subcategories of Affect resources were overused in online classes. Foreign teachers delivered more Judgement in online class. All the subcategories of Judgement were overused in online class. Compared with reaction of Appreciation in offline class, reaction of Appreciation is the only one subcategory for foreign teachers' underuse in the online class. Since the interaction is restrained by the online lectures to a large extent, foreign teachers made more efforts to have attitudes of Affect, Judgement and Appreciation everywhere in online class. For instance:

Excerpt 10

<02><Male Teacher> So it's been a lot of fun. I've <happiness>enjoyed</happiness> it, and I still have a lot more to watch. (JS217E2MP6)

Excerpt 11

<36><Female Teacher> So I'll hopefully <capacity>be able to</capacity> respond in a little bit more of a timely manner to your questions and messages. (JS217E2MLY1)

Excerpt 12

<12><Male Teacher> Then that central idea is a complete sentence, should <normality>always be</normality> a complete sentence. (JS217E2MPA15.2)

Excerpt 13

<03><Male Teacher> Most people don't think that their voice sounds good, but <composition>some people</composition> do have that special voice, maybe the TV or the radio announcer, a <veracity>really</veracity> beautiful voice, very nice sounding, very strong. (JS217E2MPA11)

Excerpt 14

<61><Male Teacher> So if you use this kind, you really <inclination>want</inclination> to say something <valuation>significant</valuation> and <valuation>important</valuation> after it. (JS217E2MPA9)

Table 4.5 Difference of Foreign Teachers' Attitudinal Resources between Online and Offline Classroom

Discourse

Categories and Subcategories		Frequencies in Online Class	Frequencies in Offline Class	Loglikelihood	Overuse/ Underuse
Affect	inclination	1314	408	+426.68	Overuse
	safety	703	565	+5.51	Overuse
	satisfaction	917	800	+1.08	Overuse
	happiness	337	132	+75.91	Overuse
Judgement	capability	291	146	+37.35	Overuse
	tenacity	728	146	+374.45	Overuse
	normality	1410	314	+662.27	Overuse

	veracity	414	222	+43.52	Overuse
	propriety	288	232	+2.18	Overuse
Appreciation	reaction	334	1203	-599.28	Underuse
	composition	670	160	+294.47	Overuse
	valuation	442	158	+116.60	Overuse

p<0.05, critical value=3.84

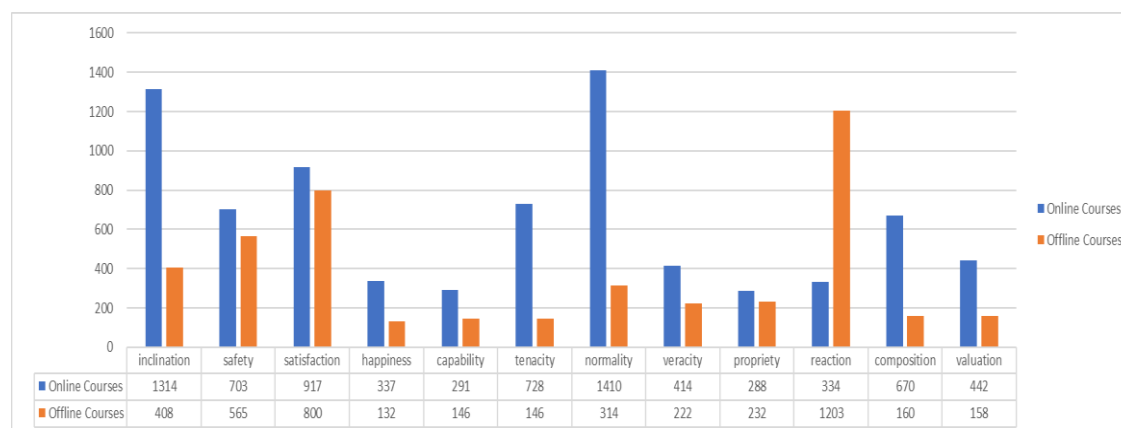


Figure 4.3 Foreign Teachers' Attitudinal Resources in Online and Offline Classroom Discourse Analysis

4.3 Chinese and English Teachers' Language Choice in University Classroom Discourse

Currently, the proportion of Chinese teachers' attitudinal resources in the corpus is significantly lower than those of Foreign teachers. As Table 4.6 illustrates, in the classroom discourse of Chinese teachers, excluding the overuse of the subcategory capability of Judgement, all the other subcategories of Affect, Judgement, or Appreciation were generally underused than those of foreign teachers, reflecting the stronger expression of Attitude by foreign teachers in classroom discourse. From the comparison results of these data, it can be concluded that foreign teachers have a much stronger direct attitude expression than Chinese teachers. In terms of vocabulary alone, foreign teachers' classroom discourse can reflect more obvious attitude feedback.

As what shows in the table and the figure, all the four subcategories of Affect were underused in Chinese teachers' class, it can be concluded that foreign teachers' feelings are richer than Chinese teachers in university English class. Such as Excerpt 15, 16 and 17.

Excerpt 15

<715><Male Teacher> So there we have a <satisfaction>lovely</satisfaction> example of paraphrase.

(LD11E1MJE2)

Excerpt 16

<191><Male Teacher> Hmm, it <insecurity>may</insecurity> be hard the whole work, but <satisfaction>pretty good</satisfaction>. (LD11E1MJE3)

Excerpt 17

<01><Female Teacher> I am so <happiness>excited</happiness> to teach you again. (JS217E2FLY1)

Chinese teachers pay more attention to the capability and attach less attention to the appreciation. Foreign teachers seem not to worry about the students' capability. When they give lectures, they cannot use Chinese and English interchangeably like Chinese teachers, so this is why capability resources are the only one underused subcategory of the four categories in the foreign teachers university classroom.

Excerpt 18

<15><Male Teacher> Now, that was really <reaction>easy</reaction> for you when you were telling your own story, like in this first speech, right? (JS217E2ML6)

Excerpt 19

<094><Female Teacher> You are very <satisfaction>good</satisfaction> at talking to other people and communicating. (LD11E1FJU4)

Table 4.6 Difference of Attitudinal Resources between Chinese and Foreign Teachers' University English Classroom Discourse

Categories and Subcategories		Frequencies in Chinese Teachers' Classroom Discourse	Frequencies in Foreign Teachers' Classroom Discourse	Loglikelihood	Overuse/Underuse
affect	inclination	474	1726	-814.88	Underuse
	safety	580	1268	-294.53	Underuse
	satisfaction	1341	1723	-66.63	Underuse
	happiness	472	471	-0.44	Underuse
Judgement	capability	618	439	+22.89	Overuse
	tenacity	168	874	-556.53	Underuse
	normality	200	1726	-1455.70	Underuse
	veracity	360	636	-90.51	Underuse
	propriety	258	522	-103.50	Underuse
appreciation	reaction	1718	2247	-96.79	Underuse
	composition	271	830	-323.37	Underuse
	valuation	206	600	-219.38	Underuse

* p<0.05, critical value=3.84

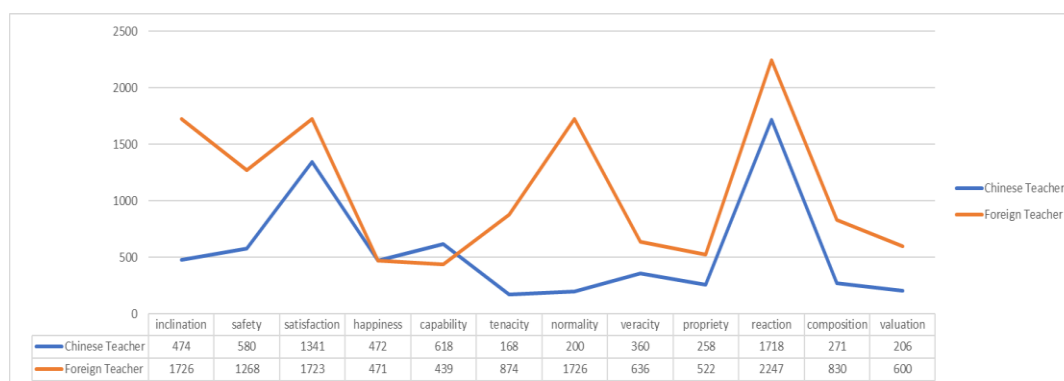


Figure 4.4 Chinese and Foreign Teachers' Attitudinal Resources in University English Class

When it comes to the positive attitude and negative attitude, Chinese teachers' attitudes are

more positive than negative in their own English university classes. All the ten Chinese teachers use “will, want, try” to indicate inclination, adopt “good, better” to express satisfaction, choose “all, whole” to represent composition, employ “important” for valuation, “can” for capability, “please” for propriety. However, the number and richness of the negative attitude words are much less than those of the negative ones. Even if the teachers have to express negative meanings, all of them use “maybe” to decrease the degree of the potential damage to the interlocutors. These spontaneous expressions indicated the mild negation. Moreover, all the teachers avoid taking the negative attitudes towards valuation, veracity and propriety.

Excerpt 20

<28><Female Teacher>Hmm, if we <inclination>wanted</inclination> a new sofa of, or a week on a lakeside cabin, we saved up for it. (HH312N2FB5)

Excerpt 21

<088><Female Teacher> So this is <insecurity>maybe</insecurity><reaction>impatience</reaction>. (HH312N2FB5)

Excerpt 22

<07><Female Teacher> So this part is more <valuation>important</valuation> is the structure, but the <composition>whole</composition> passage. (HH203E1FL1)

Table 4.7 Chinese Teachers’ Frequently Used Attitudinal Words in University English Classroom (Coverage \cong 50%, Frequency: Rank \cong Top 5 in Descending Order)

Types of Resources		Positive	Negative
Affect	Dis/inclination	will(484) ¹⁰ , should(357) ⁹ , want(250) ¹⁰ , try(213) ¹⁰ , continue(115) ⁸	won't(16) ⁵
	Un/happiness	happy(31) ⁷ , love(55) ⁸ , enjoy(34) ⁶ , fun(17) ⁵ , laugh(12) ⁵	angry(53) ⁵ , hate(26) ⁵ , sad(21) ⁷
	In/security	must(84) ⁸ ,sure(61) ⁶ ,certain(37) ⁸ , believe(34) ⁷ ,certainly(14) ⁵	maybe(346) ¹⁰ ,might(14) ⁶
	Dis/satisfaction	good(908) ¹⁰ ,better(178) ¹⁰ , great(107) ⁸ ,agree(37) ⁸ ,correct(22) ⁶	bad(91) ⁶ ,avoid(29) ⁶ , refuse(28) ⁷
Appreciation	Reaction	famous(49) ⁶ ,clearly(43) ⁵ , easy(43) ⁹ ,interested(30) ⁶ ,active(24) ⁶	poor(65) ⁷ ,nervous(47) ⁵ , difficult(43) ⁷ ,boring(22) ⁶ ,upset(16) ⁵
	Composition	all(512) ¹⁰ ,main(223) ⁸ , whole(185) ¹⁰ ,part of(72) ⁸ ,include(37) ⁵	without(119) ⁸
	Valuation	important(137) ¹⁰ ,key(41) ⁵ , necessary(17) ⁶ ,significant(16) ⁶ ,useful(14) ⁶	—
Judgement	Capability	can(1352) ¹⁰ ,finish(70) ⁸ , Able to(25) ⁸ ,complete(17) ⁵ ,achieve(17) ⁵	can't(54) ⁸
	Tenacity	according to (98) ⁷ ,keep(97) ⁷ , strongly(58) ⁷ ,supporting(22) ⁵	worried(28) ⁵
	Normality	always(116) ⁹ ,usually(71) ⁸ , common(40) ⁵ ,general(30) ⁶ , traditional(30) ⁷	strange(27) ⁶ ,particular(15) ⁵
	Veracity	actually(346) ⁹ ,in fact(64) ⁷ , true(46) ⁶ ,exactly(25) ⁵	—
	Propriety	please(277) ¹⁰ ,thank you(39) ⁵ , sorry(35) ⁸ ,see you(21) ⁵	—

* Numbers in the parentheses indicating Frequency (Rank \cong Top 5 in Descending Order)

Numbers in the right upper corner representing coverage (\cong 50%)

As for the foreign teachers, they are more positive in their own classes as well. All the five foreign teachers use “will, want, try, would like” to express inclination, employ “love, happy” to deliver happiness, apply “sure, believe” for security, “good, great, correct, better” for satisfaction, resort to “interesting, nice, good, interested, beautiful” for reaction, make use of “ all, main, part

of, include, whole” for composition, adopt “important, key, useful, helpful” for valuation. Foreign teachers’ attitude to Judgement are also very rich. All the five foreign teachers frequently utilize “can, be able to, complete, finish” for capability, take advantage of “strong, keep” for tenacity, avail themselves of “always, usually, never, sometimes, common” for normality, “actually, true, exactly, real, in fact” for veracity and “please, thank you, sorry, see you” for propriety.

Foreign teachers choose “won’t” for the expression of inclination. When they have to articulate the negative feelings, all the five teachers use “maybe, might, probably”, trying their best to spare the negative feelings, as what the Chinese teachers do. All the five teachers bluntly release the feeling of dissatisfaction by the use of “bad”. Unlike Chinese teachers, all the five foreign teachers frequently describe the composition through the word “without”. But all the five teachers avoid the negative valuation as what the Chinese teachers do. All the five make the negative Judgement of capability.

Excerpt 23

<58><Male Teacher> If you're looking at the PowerPoint, you <capability>cannot</capability> be making eye contact with the audience. (JS217E2MPA13)

Excerpt 24

<252><Female Teacher> But you <capability>cannot</capability> get it in reality before you get it. (LD11E1FJU5)

Excerpt 25

<47><Male Teacher> If I expect, uh, the speaker to be very <reaction>knowledgeable</reaction> about the topic, but he's not, I'll be <unhappiness>disappointed</unhappiness>, and that will cause me to have a <dissatisfaction>bad</dissatisfaction> attitude. (JS217E2MPA9)

Excerpt 26

<208><Female Teacher>This is a <dissatisfaction>bad</dissatisfaction> idea. (LD11E1FJU3)

Excerpt 27

<87><Female Teacher> So I run on sentence error is when you have two sentences joined <composition>without</composition> a comma and, or a connecting word. (JS217E2MLY8)

Excerpt 28

<73><Male Teacher>My slides here <insecurity>maybe</insecurity> have too many words, but I <inclination>try to</inclination> keep them simple. (JS217E2MPA13)

Table 4.8 Foreign Teachers’ Frequently Used Attitudinal Words in University English Classroom (Coverage \geq 50%, Frequency: Rank \leq Top 5 in Descending Order)

Types of Resources		Positive	Negative
Affect	Dis/inclination	will(940) ⁵ ,want(801) ⁵ ,try(115) ⁵ ,would like(54) ⁵ ,gonna(46) ³	won't(16) ⁵
	Un/happiness	love(131) ⁵ ,enjoy(39) ⁴ ,happy(34) ⁵ ,laugh(16) ⁴ ,funny(14) ⁴	angry(14) ⁴ ,hate(9) ⁴ ,annoying(6) ³ ,sad(8) ³
	In/security	must(132) ² ,sure(115) ⁵ ,believe(91) ⁵ ,trust(15) ³ ,no doubt(9) ³	maybe(432) ⁵ ,might(296) ⁵ ,probably(70) ⁵
	Dis/satisfaction	good(630) ⁵ ,great(164) ⁵ ,correct(140) ⁵ ,agree(63) ⁴ ,better(33) ⁵	bad(68) ⁵ ,waste(28) ⁴ ,disagree(6) ³ ,complain(6) ³
Appreciation	Reaction	interesting(64) ⁵ ,nice(59) ⁵ ,good(52) ⁵ ,interested(50) ⁵ ,beautiful(37) ⁵	nervous(42) ⁵ ,expensive(29) ⁴ ,negative(26) ³ ,terrible(13) ⁴ ,crazy(8) ⁴

	Composition	all(598) ⁵ ,main(132) ⁵ , part of(95) ⁵ ,include(48) ⁵ ,whole(33) ⁵	without(32) ⁵ ,despite(7) ³
	Valuation	important(265) ⁵ ,key(53) ⁵ , useful(28) ⁵ ,helpful(26) ⁵ ,significant(21) ⁴	—
Judgement	Capability	can(1566) ⁵ ,be able to(87) ⁵ , complete(84) ⁵ ,finish(64) ⁵	can't(121) ⁵
	Tenacity	strong(73) ⁵ ,supporting(68) ⁴ , keep(65) ⁵ ,reliable(12) ⁴ ,convincing(8) ³	worried(23) ³
	Normality	always(190) ⁵ ,usually(114) ⁵ , never(94) ⁵ ,sometimes(92) ⁵ ,common(74) ⁵	particularly(39) ⁴ ,strange(21) ⁵ , suddenly(10) ³
	Veracity	actually(106) ⁵ ,true(74) ⁵ , exactly(48) ⁵ ,real(42) ⁵ ,in fact(21) ⁵	fake(6) ³
	Propriety	please(158) ⁵ ,thank you(69) ⁵ , sorry(51) ⁵ ,see you(27) ⁵ , good afternoon(10) ³	—

* Numbers in the parentheses indicating Frequency (Rank \leq Top 5 in Descending Order)

Numbers in the right upper corner representing coverage (\geq 50%)

Foreign teachers' attitudes are more profuse in classroom discourse.

5. Conclusion

Using the appraisal framework (Martin & White 2005), the main objective of the current study was to examine the Chinese and foreign teachers' attitude in University English classroom discourse. Two conclusion can be drawn from the findings and discussion. First, this recent study has shown that all the attitudinal resources are to be found in both Chinese and foreign university English classroom discourse. Chinese teachers' attitudinal resources differ in classes of different grades and of different majors (English majors and non-English majors). Foreign English teachers' attitudinal devices differs between offline and online classes. Second, both Chinese and foreign teachers' attitudes are more positive than negative in their own class, but foreign teachers' attitudinal devices are more expressive and productive than Chinese teachers in University English classes.

The research reflects some realities of English teachers' attitude in university English classrooms from the study of Attitude system of Appraisal Theory, and provides implications for the English teachers' professional development in China.

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Appendix I

More information of Chinese Teachers and Their Classroom Discourse in the Present Study

No.	File Name	English Majors / Non-English Majors	Grade	Types	Tokens	University Type	Province	Off-line (Y/N)
1	JC201E2FZ	English Majors	Lower	1, 223	7, 807	A Provincial University 985, 211	Jilin	Y
2	HH203E1FL	English Majors	Lower	889	6, 363	A Provincial University 985, 211	Heilongjiang	N
				2, 849	44, 060			Y
3	JC114E2ML	English Majors	Lower	1, 282	11, 415	directly administrated by the Ministry of Education of China 211	Jilin	Y
4	HH207N1FLY	Non-English Majors	Lower	889	4,,773	A Provincial University 985, 211	Heilongjiang	Y
5	HH207E2MW	English Majors	Lower	2, 975	57, 280	A Provincial University 985, 211	Heilongjiang	Y
6	JS217E3FJY	English Majors	Higher	2, 551	51, 732	A Provincial University 985, 211	Jilin	Y
7	HH207N1FW	Non-English Majors	Lower	1, 191	13, 342	A Provincial University 985, 211	Heilongjiang	Y
8	JC104N1MX	Non-English Majors	Lower	1, 154	8, 962	directly administrated by the Ministry of Education of China 985	Jilin	Y
9	HH312N2FB	Non-English Majors	Lower	1, 408	13, 220	Non-government University 985, 211	Heilongjiang	Y
10	LD119N1FL	Non-English Majors	Lower	1, 200	15, 969	directly administrated by the Ministry of Education of	Liaoning	Y

						China 985		
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Appendix II

More information of Foreign Teachers and Their Classroom Discourse in the Present Study

No.	Teachers' Name	Course Name	Nationality of the Teacher	Grade	English Majors' / Non-English Majors' Class	Types	Tokens	Province	Offline (Y/N)
1	LD11E1MJE	Spoken English	U.S.A	2 nd	English Majors	2, 713	30, 617	Liaoning	Y
2	LD11E1FJU	Spoken English	U.S.A	1 st	English Majors	2, 302	31, 140	Liaoning	Y
3	LD11N1MVI	Spoken English	U.S.A	2 nd	Non-English Majors	2, 500	38, 772	Liaoning	Y
4	JS217E2MPA	English Speech	Unknown	Unknown	Unknown	3, 903	80, 027	Jilin	N
5	JS217E2FLY	English Writing	Unknown	Unknown	Unknown	2, 162	28, 693	Jilin	N

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A Case Study of College English Teachers' Emotional Experiences in a Blended Teaching Context

混合式教学情境下大学英语教师情感体验案例研究

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Abstract

Blended teaching has become the new normal in higher education due to the ongoing technological transformation and the impact of COVID-19. Meanwhile, it leads to special emotional experiences, as both teachers and learners switch back and forth between the online and offline worlds. The current language education research has witnessed a surge in teacher emotion studies, as its crucial role in teaching has been recognized. Researchers argue that teacher emotion profoundly impacts teaching quality, teacher-student relationships, and teachers' professional development. However, limited efforts are found to explore the Chinese College English teachers' emotions in a blended teaching context. Thus, this qualitative case study is designed to unravel the emotional experiences of four Chinese College English teachers and to explore how their emotions emerge in a blended teaching context. Research data is mainly collected from interviews and case documents. The findings show that the participants have positive, negative, neutral, and mixed emotional experiences in the blended teaching context. Furthermore, their emotions are shaped by their continuous appraisal of the interaction between their personal goals and various ecological systems. The research findings highlight the essential role of teacher emotion in blended teaching and draw our attention to teacher emotion in Computer-Assisted Language Learning (CALL).

Keywords: teacher emotion; blended teaching; language teacher development; ecological system theory

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1. Introduction

Educational research has gradually taken an emotional turn, considering teaching as an emotional practice (Beatty, 2000; Hargreaves, 1998; 2000). With the progress of research in this field, teacher emotion attracts increasing attention as its important role in teaching has been recognized. Researchers argue that teacher emotion has a profound impact on teaching quality, teacher-student relationships, teachers' professional development, and students' academic performance (Sutton & Wheatley, 2003; Schutz & Pekrun, 2007; Schutz & Zembylas, 2009).

In the field of foreign language education, with the ongoing technological transformation and the impact of COVID-19, blended teaching has become the new

normal in higher education (Jost et al., 2021). At the same time, College English teachers are also trying various new teaching models such as flipped classrooms and online-offline blended teaching (Hu & Xu, 2022). Characterized by the systematic integration of online and face-to-face learning, blended teaching leads to special emotional experiences (Zhao & Song, 2022), as both teachers and learners switch back and forth between the two worlds, online and offline (Ellis, 2014).

Previous studies have sought to investigate the nature of emotions and teachers' emotional experiences in the context of both offline teaching (Cross & Hong, 2009; Lee & Yin, 2011) and online teaching (Liu et al., 2022), the sources or influencing factors of teacher emotion (Cross & Hong, 2012; Gu & Mao, 2022), and how teachers regulate their emotions (Fried, 2011; Gu & Gu, 2019). Researchers found that teachers experienced more negative emotions (e.g., anxiety, anger, sadness) than positive emotions (e.g., happiness, pride) in technology-enhanced environments, particularly when they interact with students in online teaching, due to students' failure to understand teachers' teaching goals (Wiebe & Kabata, 2010), low engagement in interactions (Liu et al., 2022), and relatively poor learning outcomes in online courses (Emerson & MacKay, 2011). In addition to student factors, features of online teaching, such as high frequency of technological problems, difficulty in conducting interactions, and poor network conditions, are also crucial in eliciting various foreign language teacher emotions (Gu et al., 2022).

While research on teacher emotion has been done on teachers' emotional experiences and their sources or influencing factors, few concerns language teacher emotions in a blended teaching context. Related studies in the context of Chinese College English courses are even fewer. Moreover, limited studies have explored teachers' emotional experiences in different areas of China. Given that teachers' emotions are culturally specific (Mesquita, Leersynder, & Albert, 2014), and the differences in sociocultural backgrounds between the east and west of China (Tong, 2003), teachers in eastern China and western China are expected to experience various emotions, which could exemplify the complexity of teachers' emotional experiences and expand the knowledge landscape on the emergence of teacher emotion in different sociocultural contexts. Thus, this study is designed to unravel the emotional experiences of four College English teachers in Eastern and Western China and to explore how their emotions emerged in a blended teaching context. In line with the purposes of the study, two research questions will be addressed:

RQ1. What emotions did these College English teachers experience in the blended teaching context?

RQ2. How did their emotions (e.g., enjoyment, pride, anger, anxiety) emerge in the blended teaching context?

This study can not only help College English teachers better understand their emotional ups and downs in a blended teaching context, but also help them reflect on how their emotions emerge in this context. Furthermore, this study will give college administrators and policymakers some implications in providing external support for College English teachers to cater to their different emotional experiences. Hopefully, the findings of this study will not only provide some empirical evidence for the study

of Chinese College English teachers' emotions in similar contexts, but also provide implications for enhancing blended teaching and teaching effectiveness.

2. Literature review

2.1 Studies on teachers' emotional experiences

Researchers have explored teachers' emotional experiences both in offline teaching contexts and online teaching contexts.

Previous studies mainly explore teachers' emotional experiences in offline teaching contexts. Researchers have found that teachers experience various emotions in their teaching practices, which can be mainly divided into three categories: positive emotions, negative emotions and mixed emotions. For example, Yin (2006) adopted a cultural-individual perspective to explore 30 teachers' emotional experiences in curriculum implementation in four schools in Guangzhou City, Guangdong Province, and found teachers experience three types of emotions in curriculum implementation, namely positive emotions (e.g., happiness, enthusiasm, hope), negative emotions (e.g., boredom, at a loss, resistance), and mixed emotions (e.g., love and fear). In addition to the above trichotomy of emotional experiences, emotional experiences can be classified in a more detailed way. Cross Francis et al. (2020) explored elementary teachers' emotions while preparing for teaching and during teaching mathematics and found that teachers reported six categories of emotions (positive, negative, neutral, blended-positive, blended-negative, and mixed), described emotions often in non-typical ways (e.g., "not nervous", "anxious but in a positive way"), and experienced mixed emotions (co-occurrence of positive and negative emotions) as the most dominant emotion. It should be noted that they found that neutral emotions were not as frequent as positive or negative emotions. However, teachers occasionally reported their general sense of competence in classroom teaching using neutral terms such as "comfortable," "calm," and "relieved," or denial of negative emotions such as "not nervous" and "not anxious". Teachers also reported neutral emotions when receiving support.

Recently, online teaching has gained increasing popularity and received scholarly attention due to the information technology revolution and the post-epidemic era. Liu et al. (2022) explored livestream English teaching anxiety experienced by high school teachers through interviews with 12 high school EFL teachers from China. Six types of anxiety were identified at the macro, exo, and micro levels, namely, anxiety related to the COVID-19 pandemic, limited technological support from school authorities, students' parents, inadequate technological pedagogical and content knowledge, and insufficient effective teacher-student interactions. Badia et al. (2019) conducted research to identify the types of emotions online teachers feel in response to the experience of teaching online in an online university. Three emotions linked to teaching online were identified in their study: satisfaction, relief and pleasure. Findings suggest that satisfaction is associated with the instructional design and learning support roles and with the knowledge building approach; relief is inversely related to the content acquisition approach; and pleasure is linked to variables such as academic background and amount of online teaching hours, as well as the knowledge

building approach. Taylor et al. (2022) explored the emotional experiences of transitioning to teaching online. Their inductive analysis identified three overarching themes associated with loss, grief, and hope. These themes are related to educators' perceived changes in relationships with their students, curriculum, and teaching practice.

These studies showcased that teachers experience various emotions in both offline and online teaching contexts. However, limited efforts are found to explore Chinese College English teachers' emotions in the blended teaching context. As a result, this study seeks to uncover Chinese College English teachers' emotional experiences in the blended teaching context.

2.2 Studies on emergence of teacher emotion

Limited empirical studies are found exploring the emergence of teacher emotions. Cross and Hong (2012) used Bronfenbrenner's ecological system framework (Bronfenbrenner, 1979; Bronfenbrenner & Morris, 2006) to examine how teachers' internal psychological characteristics transact with external environments to produce emotions. In their study, they found that teachers experienced unpleasant emotions such as disappointment and frustration in their daily work. However, instead of dwelling on the unpleasant emotions, they shifted their thinking to consider ways they could achieve more favorable outcomes. These coping strategies were deeply connected to their individual psychological biographies, specifically their pedagogical beliefs and well-developed professional identity. Gu (2016) explored how Chinese university EFL teachers' emotions are shaped in their research life by deploying the qualitative narrative case study method. He found that these university EFL teachers' emotions are shaped by their continuous appraisal of the interaction of their research beliefs or goals and ecological systems in their research life. It includes teachers' appraisal of directionality and problem-solving efficacy. When teachers appraise that their belief or research goal is consistent with the triggering factors in the ecological systems, their positive emotions emerge. When teachers appraise that their beliefs or research goals are inconsistent with the triggering factors in the ecological systems, especially when teachers lack problem-solving efficacy, their negative emotions emerge. In addition, his study unraveled some triggering factors of teacher emotion. Triggering factors in the Microsystem and Mesosystem can be people (such as supervisors, colleagues, or administrators), research related activities, or matters of system structure or context. Matters of system structure or context include research policy and rules, research atmosphere, research conditions and professional standing, such as journals and discipline status. All these factors play a major impact on shaping teachers' emotions. The relationship between family, teaching and research in the mesosystem as well as power hierarchy, academic internationalization and utilitarianism in the Macrosystem also influence the state of teacher emotion.

To sum up, the studies reviewed above offer an advantageous background for the current study and indicate a clear direction about studies on teachers' emotional experiences. However, scant attention has been paid to how Chinese College English teachers' emotions emerge in the blended teaching context. Therefore, this study aims to unpack the emergence of their emotions in the blended teaching context.

2.3 Understanding Teacher Emotion from an Ecological and Appraisal-based Perspective

With the “ecological turn” of applied linguistics (Larsen-Freeman, 2016), numerous studies (e.g., Cross & Hong, 2012; Liu et al., 2022) started to focus on language education from the perspective of ecology. Inspired by Bronfenbrenner’s (1979, 1992, 1993) ecological system, we proposed a four-layered nested analytical framework to view the triggering factors of teacher emotion. The microsystem contains various activities, an individual’s roles and interpersonal relationships in a given setting with particular physical and material characteristics. In this study, the microsystem mainly consists of significant others (e.g., students and colleagues), and important activities (e.g., blended teaching model implementation), since all these are closely related to immediate experiences in blended teaching. The exosystem refers to a number of settings that do not actively involve the individual but affect, or are affected by, what happens in the setting containing the developing person. In this study, it includes school authorities and technical staff. School authorities fulfill the responsibilities of implementing the requirements and policies from the local Education Bureau or the Ministry of Education (Liu et al., 2022), administrating the teachers’ blended teaching and evaluating their teaching performance. In this system, the teachers do not take part in making policies or requirements related to school management; however, these events may cause them various emotions. Technical staff performs the duty to solve technological problems and maintain the online course platform to relieve teachers’ technology anxiety. The macrosystem refers to the broader cultural context of an individual and influences interactions in all other layers. In this study, the macrosystem refers to the technology situation and the COVID-19 pandemic etc. The chronosystem represents the factor of time, since time often brings changes in life events and experiences that alter the relationship between the individual and the environment.

In addition, Frenzel’s (2014) appraisal-based model on causes of teacher emotions is applied to explore the emergence of teacher emotion. Teacher emotions result from appraisals pertaining to their personal goals. In specific, teachers’ emotional experiences are determined based on their judgments regarding whether their personal goals are aligned with the triggering factors in the external environment. Regarding teachers’ appraisals and resulting emotions, the model proposes that there are five important appraisal dimensions, including goal consistency appraisals, goal conduciveness appraisals, coping potential appraisals, goal attainment/impediment responsibility appraisals, and goal importance appraisals. Generally, goal consistency and goal conduciveness appraisals should determine the valence of the emotions experienced (positive vs. negative). Goal importance appraisals should determine the intensity of the emotional experience, with higher relevance typically leading to higher intensity for both positive and negative emotions. Coping potential and responsibility appraisals should determine both the valence and the intensity of the experienced emotion.

Enlightened by Bronfenbrenner’s ecological system theory and Frenzel’s model on causes of teacher emotions, this study proposed that teachers’ emotions emerged

from teachers' continuous appraisal between the interaction of their personal goals and ecological systems (i.e., Microsystem, Mesosystem, and Macrosystem) in their life. There are five types of appraisals in total and different appraisals combined will elicit different emotions.

3. METHODOLOGY

3.1 Setting

With the rapid development of modern information technology, network teaching platforms and students' autonomous learning platforms have been common in Chinese colleges and universities. At the same time, College English teachers are also trying various new teaching models such as online-offline blended teaching (Hu & Xu, 2022). Considering this background, this study was conducted in the College English course, which is a compulsory course for non-English majors in the undergraduate education stage, serving as an important part of higher education in China.

This study was conducted in two cities, a well-developed city S located in the east of China, and a developing city W located in the west of China. In city S, two universities of various types were chosen: a key comprehensive university and a city university. In city W, one west normal university was chosen for this study.

3.2 Participants

Based on the criteria of "purposeful sampling" (Patton, 1990), four College English teachers who have adopted a blended teaching approach in their class were invited to participate in the study. As Chen (2000) points out, purposeful sampling aims to find samples in specific contexts which can answer research questions in a relatively integrated and accurate way. Under the guidance of this principle, these participants were selected because they have a relatively close relationship with the researcher, and they are willing to share their emotional experiences. Furthermore, the four participants were selected to maximize variation, targeting a mixture of gender, years of teaching, academic title, educational background, and university type, which allow for coverage of the variety of situations in the phenomenon under study. The demographic profile of the four participants is shown in Table 1.

Table 1. The profile of four participants

Participant	Gender	Years of Teaching	Professional Title	Educational Background	University Type
George	Male	7	Associate professor	Ph.D.	An east key comprehensive university
Tina	Female	12	Lecturer	Master degree	An east city university
Zoe	Female	5	Lecturer	Master degree	A west normal university
Helen	Female	25	Associate professor	Master degree	A west normal university

3.3 Data Collection

In this study, qualitative data were collected through semi-structured interviews and case documents. The semi-structured interviews serve as the major data source,

while the case documents serve as supplementary data sources, verifying the contents of interviews and providing more information for research questions.

In terms of interviews, a total of four online interviews with each participant were held at Tencent Meeting. Each interview lasted about 60-90 minutes. The participants were encouraged to share their emotional experiences in the context of blended teaching. Besides, the interviews were conducted in the participants' first language and recorded by electronic recording devices with the participants' consent. Written notes were taken during the interviews to track participants' statements and expressions (Creswell, 1998). The participants further validated transcriptions of the audio recordings. To protect the privacy of participants, their names were kept unrevealed throughout the research process.

Case documents include texts, pictures, audio, videos and objects related to the research questions (Gu, 2016), for example, teachers' teaching syllabi, PPTs concerning blended teaching, students' reflective writing, WeChat and email communications, etc. On the one hand, they can provide abundant personal experiences of the participants to help answer the research questions such as teachers' emotional experiences and how their emotions emerge. On the other hand, they can confirm the validity and accuracy of the data collected through the interviews.

3.4 Data Analysis

The inductive approach was deployed in the qualitative data analysis. The recorded interviews were first transcribed into four transcripts, with a total word count of over 120,000. Then, the interview transcripts were carefully read and re-read by the researchers before being broken down into several categories. For the first reading, the whole transcripts were reviewed, and specific episodes related to teacher emotion (signaled by keywords like "pride", "anxiety", and "anger") and its emergence were captured. For the later re-reading process, content analysis was adopted to analyze the interview data, through which the deeper meanings could be explored so as to add in-depth and broad interpretation to the analysis. These episodes were assigned into different categories and sub-categories. Consequently, themes regarding the emergence of teacher emotions were identified. For example, the emergence of anger was identified as: (a) interactions between teachers' goals and students' behaviors in the microsystem, (b) interactions between teachers' goals and technology situations in the macrosystem, and (c) interactions between teachers' goals and school authorities in the exosystem. Following that, sub-categories were further divided from these categories. For instance, students' cheating on their homework, students' ignorance of online learning resources, and students' inattentive listening to teachers in class were attributed to the subordinate category of "interactions between teachers' goals and students' behaviors". To ensure the trustworthiness of the data analysis, the researchers adopted member checks in the study. Revisions had been made where information had been mistakenly read during transcription.

4. Findings

The data analysis revealed the emotional experiences of these four College English teachers in a blended teaching context, and how four typical and the most frequently

experienced emotions (enjoyment, pride, anger and anxiety) emerged in the blended teaching context.

4.1 College English Teachers' Emotional Experiences in the Blended Teaching Context

This section addresses the first research question on the emotional experiences of four College English teachers in a blended teaching context. Four major types of teachers' emotional experiences emerged in the order of frequency: positive emotions (4/34), negative emotions (4/31), neutral emotions (2/8), and mixed emotions (2/3).

4.1.1 Positive emotions

Four participants experienced altogether six ranges of positive emotions, which included enjoyment (4/16), pride (4/11), gratitude (2/3), excitement (1/2), curiosity (1/1), and hope (1/1).

Table 2. Detailed codes with frequency counts are included under each theme.

Themes-Sub-themes	Codes
<u>Positive emotions</u>	
Enjoyment (16)	Enjoyment related to the advantages of the blended teaching model implementation (13) Enjoyment related to students' positive behaviors (2) Enjoyment related to colleagues' praises (1)
Pride (11)	Pride related to students' positive performance (8) Pride related to colleagues' praises (1) Pride related to school authorities' recognition (1) Pride related to leading colleagues in exploring blended teaching (1)
Gratitude (3)	Gratitude related to school authorities' support (1) Gratitude related to students' assistance (1) Gratitude related to colleagues' cooperation (1)
Excitement (2)	Excitement related to students' active classroom interactions (1) Excitement related to the display of students' high-quality homework in public (1)
Curiosity (1)	Curiosity related to the initial stage of blended teaching model implementation (1)
Hope (1)	Hope related to the potential positive effects of blended teaching model implementation (1)

Numbers in the bracket refer to the frequency of occurrence of the target code or theme in the data.

First, the most frequent type of positive emotion that the teachers experienced was enjoyment. Three major types of enjoyment emerged in the order of frequency: enjoyment related to the advantages of the blended teaching model implementation (4/13), enjoyment related to students' positive behaviors (2/2), and enjoyment related to colleagues' praises (1/1). All four teachers acknowledged their enjoyment concerning the advantages of the blended teaching model implementation, such as making up for the limited offline learning time, increasing learning resources, providing convenience for students and teachers, enhancing teacher-student interactions, etc. For example, Tina expressed her enjoyment when the blended

teaching model solved the problem of students' limited learning time.

Extract 1.

One big advantage of the blended teaching model is that we teachers can share a wealth of learning resources on the online course platform. As we know, College English class time is now compressed and reduced, but our teaching content is not reduced. Thanks to the blended teaching model, knowledge that cannot be taught in class can now be uploaded to the online course platform for students to learn after class. Thus, it helps us solve the bottleneck problem of insufficient amount of College English offline class time. I felt very happy when it helped me solve this problem. (Tina)

All four participants experienced pride in the blended teaching context, including pride related to students' positive behaviors (3/8), colleagues' praises (1/1), school authorities' recognition (1/1) and leading colleagues in exploring blended teaching (1/1). Students' positive performance, including benefiting from the class, expressing likes to the teacher, offering positive feedback, etc., are the primary cause of pride of these four teachers. Zoe experienced pride when her students enjoyed and benefited from her class.

Extract 2.

I've had a few classes where some outgoing students sent me unsolicited WeChat messages after the class, telling me how great they felt about my class and how my teaching inspired them. I experienced pride when I saw those messages, and I think this is the meaning of being a teacher. (Zoe)

Two participants, George and Tina, experienced altogether three kinds of gratitude, including gratitude related to school authorities' support (1/1), students' assistance (1/1), and colleagues' cooperation (1/1).

The other three positive emotions, namely excitement, curiosity, and hope, were mentioned by only one participant each. Tina was reported to have experienced excitement related to students' active classroom interactions, as well as the display of their high-quality homework in public. In addition, she experienced curiosity at the initial stage of adopting the blended teaching model. Hope was mentioned by Helen, who expected to improve students' learning efficiency by using the blended teaching model.

4.1.2 Negative emotions

Four participants experienced altogether six ranges of negative emotions, which included anger (3/9), anxiety (4/7), helplessness (3/6), disappointment (3/5), sadness (1/2), and shame (1/2).

Table 3. Detailed codes with frequency counts are included under each theme.

Themes-Sub-themes	Codes
<u>Negative emotions</u>	
Anger (9)	Anger related to technology failure (5)
	Anger related to students' misbehaviors (3)
	Anger related to school authorities' unreasonable arrangements (1)
Anxiety (7)	Anxiety related to the disadvantages or potential risks of blended teaching model implementation (6)

	Anxiety related to students' negative performance (1)
Helplessness (6)	Helplessness related to the school's lack of technological support (2) Helplessness related to students' negative performance (2) Helplessness related to colleagues' passive behaviors (1) Helplessness related to lack of reference to the blended teaching model implementation (1)
Disappointment (5)	Disappointment related to students' negative behaviors (2) Disappointment related to colleagues' passive behaviors (2) Disappointment related to the unpromising effects of blended teaching model implementation (1)
Sadness (2)	Sadness related to students' misunderstandings and misbehaviors (2)
Shame (2)	Shame related to students' unsatisfactory learning outcomes (2)

The most frequent type of negative emotion that the teachers mentioned was anger. Three major types of anger emerged in the order of frequency: anger related to technology failure (3/5), anger related to students' misbehaviors (2/3), and anger related to school authorities' unreasonable arrangements (1/1). Technology failure, such as the unstable network and the breakdown of the online course platform, is the primary factor that elicits teachers' anger. Zoe, who is a College English teacher in Western China, said the following:

Extract 3.

I remember once I had a class in the classroom and needed to use the online course platform resources, but I ended up getting angry because the computer in our school responded slowly and there were problems logging in to the online platform, plus the network was stuck. I wasted at least ten minutes waiting to switch networks, and I felt that these technological problems restricted me, and the pace of my class was completely disrupted, and both students and I felt really awful. (Zoe)

All four participants experienced anxiety in the blended teaching context, which includes anxiety related to the disadvantages or potential risks of the blended teaching model implementation (3/6) and students' negative performance (1/1). Three teachers, Tina, George and Helen, experienced anxiety due to the disadvantages or potential risks of the blended teaching model implementation. Tina felt anxious and worried that she might make language mistakes in front of a large crowd of students.

Extract 4.

I am responsible for building the learning resources on the online course platform, and the precision of language use was highly required, so I felt very anxious and worried about making mistakes. Because my online course is open to 42 classes with more than 2,000 freshmen in the whole school, I felt anxious because even if I made a mistake in one single word, it would have a huge impact at the school level and impose overwhelming psychological pressure on me. (Tina)

In addition to anxiety, Tina, George and Helen experienced altogether four kinds of helplessness, including helplessness related to school's lack of technological support (1/2), students' negative performance (1/2), colleagues' passive behaviors (1/1) and lack of reference to the blended teaching model implementation (1/1).

George, Helen, and Zoe experienced three kinds of disappointment in total, including disappointment related to students' negative behaviors (2/2), colleagues' passive behaviors (2/2) and the unpromising effects of blended teaching model implementation (1/1).

Sadness and shame are the two least mentioned negative emotions. Sadness was mentioned by only one participant, George, for students' misunderstandings and misbehaviors. Helen experienced shame because she thought that her students' learning outcomes were unsatisfactory.

4.1.3 Neutral emotions

Two participants, Tina and Helen, experienced one major neutral emotion, relief (2/7), in the blended teaching context. They have experienced three kinds of relief in total, including relief related to technical staff's help (2/4), technology development (2/2), and school authorities' support (1/1). Tina experienced relief when she received support from technical staff so that she was spared from worrying about encountering technological problems.

Extract 5.

We have strong technical support. The school has built a chat group for us teachers and technical staff. Once we encounter technical problems, we can immediately turn to the technical staff to seek help, and they will help us solve the problems. Besides, their feedback is always very timely, so we teachers no longer feel anxious about technical problems. (Tina)

4.1.4 Mixed emotions

Mixed emotions combine positive emotions and negative emotions. Two participants, Tina and Helen, experienced two kinds of mixed emotions, which include anxiety and excitement (1/2), and hope and anxiety (1/1).

Anxiety and excitement were mentioned twice by Tina. She felt anxious and excited when she adopted an innovative teaching activity in her class because she worried about whether this innovative activity would achieve good effects, and was excited to see her students enjoy and actively participate in this activity. She also felt anxious and excited due to the interdisciplinary competition, as teachers in many disciplines in her school are using the blended teaching model. As a result, she felt anxious about the interdisciplinary competition but more excited to explore and optimize the blended teaching model implementation.

Helen experienced hope and anxiety at the initial stage of the blended teaching model implementation, as she hoped that it would help students improve their English learning efficiency, but worried that whether they can implement it successfully.

Extract 6.

At the beginning, I was looking forward to the blended teaching model implementation, because some universities in Xinjiang that are parallel to ours had already implemented it in advance. According to them, the effects were quite good, so I was looking forward to this teaching model to help our students improve their College English learning efficiency. But at the same time, I was also a little anxious. When I went to other universities to learn from them, I felt that their introductions were all very general and macro. When we first started the blended teaching model,

we were really like crossing the river by feeling the stones, and we were a little worried about whether we would be able to successfully implement this model. (Helen)

4.2 The Emergence of College English Teachers' Emotions in the Blended Teaching Context

Data analysis revealed that these four emotions, enjoyment, pride, anger and anxiety, were mentioned far more frequently than any other emotion by the participants. Moreover, considering that enjoyment, anger, and anxiety are the three basic emotions which have been found to be most salient and most frequent among teachers (see Sutton & Wheatley, 2003; Frenzel, 2014; Lohbeck et al., 2018), and pride is also commonly experienced by teachers perhaps second to enjoyment (Frenzel, 2014), this study chose these four emotions, namely enjoyment, pride, anger, and anxiety, to explore how they emerged, by adopting an ecological and appraisal-based perspective.

The findings showed that teacher emotions are elicited based on teachers' appraisals concerning their personal goals. In specific, teachers have certain key goals they strive to attain in the blended teaching context, and they continually make judgments pertaining to those goals based on their perceptions of the external environment (including microsystem, exosystem, and macrosystem), hence resulting in different emotional experiences.

4.2.1 The emergence of enjoyment: positive goal attainment

The findings showed that enjoyment emerged from positive goal consistency or conduciveness, which aligned with Frenzel et al.'s (2016) findings that enjoyment is caused by appraisals that involve goal congruence and goal conduciveness. The analysis of the data in this study showed that enjoyment emerged from the interaction of teachers' personal goals and microsystems (4/16). The triggering factors in the microsystem include blended teaching model implementation (4/13), student behaviors (2/2) and colleague behaviors (1/1).

First, the advantages of blended teaching model implementation in the microsystem (i.e., increased flexibility and convenience, increased learning resources, etc.) are consistent with or conducive to teachers' personal goals, such as enriching teaching resources, enhancing teaching effectiveness, etc., thus eliciting enjoyment.

Second, enjoyment emerged from the consistency of teachers' personal goals and students' good behaviors. For example, George's students wrote in their reflection assignments that they had learned a lot from his class, which is consistent with George's personal goal of promoting student development, thus leading to enjoyment. Zoe's students expressed their satisfaction and likes to Zoe's class, which is consistent with Zoe's personal goal of winning students' likes, giving rise to enjoyment.



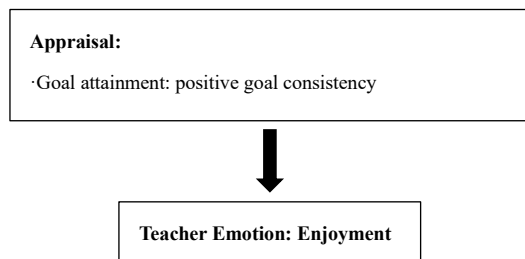


Figure 1. The appraisal pattern of George’s enjoyment

Third, one participant, George, felt happy when he was praised by his colleagues, as it is consistent with his goal of gaining recognition from others.

4.2.2 The emergence of pride: positive goal attainment + internal goal attainment responsibility

Pride emerged from positive goal consistency or conduciveness and internal goal attainment responsibility. The analysis of the data in this study showed that pride emerged from the interaction of teachers’ personal goals and microsystems (4/10), as well as exosystems (1/1). The triggering factors in the microsystem include student behaviors (3/8), colleague behaviors (1/1), and blended teaching model implementation (1/1). The triggering factors in the exosystem are supportive school authorities.

When teachers appraise that students’ positive behaviors are consistent with or conducive to their personal goals, and they attribute this positive goal attainment to internal goal attainment responsibility, pride will emerge. Tinna shared her feelings when her online classes brought benefits to her students.

Extract 7.

When my online classes do bring some benefits to the students, my pride is overwhelming, because my definition of pride is that I want the students to get something, I think the main thing is to let the students really benefit a lot, that is my understanding of success (Tina).

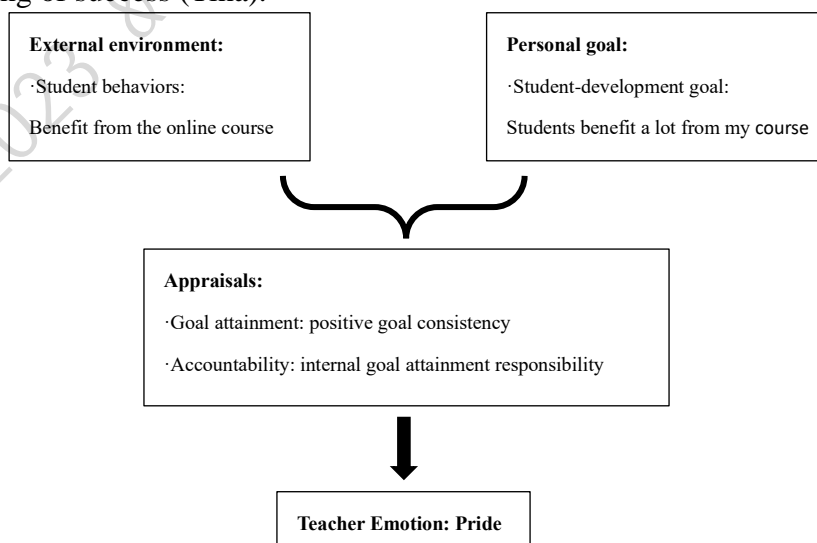


Figure 2. The appraisal pattern of Tina’s pride

In the microsystem, teachers also experienced pride related to colleagues’ positive

behaviors and blended teaching model implementation.

In the exosystem, one participant, Tina, experienced pride when her course was praised and valued by school authorities, who also approved her application for a first-class course at the school level. The recognition from school authorities is consistent with Tina's goal, and Tina mainly attributed it to her personal hard work, thus eliciting pride.

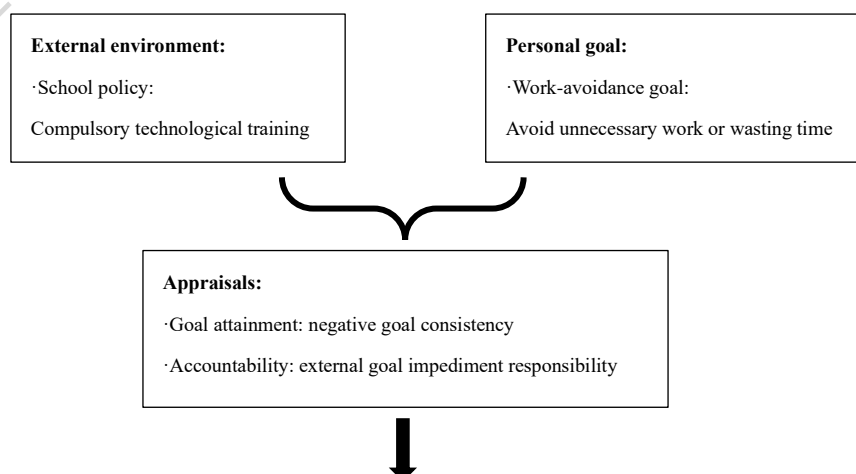
4.2.3 The emergence of anger: negative goal attainment + external goal impediment responsibility

Anger emerged from negative goal attainment and external goal impediment responsibility. The analysis of the data in this study showed that anger emerged from the interaction of teachers' personal goals and unfavorable technology situations in macrosystems (3/5), students' negative behaviors in microsystems (2/3), as well as school authorities' unreasonable arrangements in exosystems (1/1). When teachers appraised that the triggering factors in the external environment are inconsistent or uncondusive to their personal goals, and that teachers attributed it to external goal impediment responsibility, anger emerged.

Unfavorable technology situations in macrosystems, which mainly refer to unstable network connections and the breakdown of online platforms, are the primary external triggering factors of anger. Three teachers, George, Helen, and Zoe, felt angry when encountering technology failure.

Two teachers, George and Helen, experienced anger due to students' misbehaviors in microsystems. George prepared rich learning resources for students on the online course platform and hoped that students could read carefully and study well, only to find that students did not read at all, so George got angry. In this case, George's goal is inconsistent with students' behaviors, and he attributed the goal impediment responsibility to his students, thus experiencing anger.

One teacher, Zoe, felt angry because of school authorities' unreasonable arrangements in the exosystem. She was forced by school authorities to take blended teaching model training, which was viewed by her as "very easy, unnecessary, and a complete waste of time". Although she was extremely unwilling to take the training, she must obey the school's arrangement. As a result, she felt angry as she experienced negative goal attainment and external goal impediment responsibility.



Teacher Emotion: Anger

Figure 3. The appraisal pattern of Zoe's anger

4.2.4 The emergence of anxiety: negative goal attainment + low coping potential + internal goal impediment responsibility

Anxiety emerged from negative goal consistency or conduciveness, teachers' low coping potential and internal goal impediment responsibility. The analysis of the data in this study showed that anxiety emerged from the interaction of teachers' personal goals and blended teaching model implementation (3/6) and students' negative behaviors (1/1) in microsystems.

The disadvantages of blended teaching model implementation, which include increased workload, technological problems, etc., are the primary triggering factors of anxiety. Three teachers, George, Helen, and Tina, felt anxious when implementing the blended teaching model. Helen expressed her anxiety due to her low capability of dealing with technological problems. She mentioned that once the online platform failed to display students' grades, and she felt anxious as she had no idea how to deal with it. In this case, Helen experienced negative goal attainment, and her coping potential is low. Moreover, she regarded herself as incapable of solving technological problems, which led to internal goal impediment responsibility. As a result, her anxiety emerged.

Zoe felt anxious about her students' English learning because they paid little attention to the teacher in her class, which was inconsistent with her goal. In the face of this situation, she had low coping potential, not knowing how to arouse students' interest in her class. In addition, she blamed herself for not being able to attract students' attention in her class, thus her anxiety emerged.

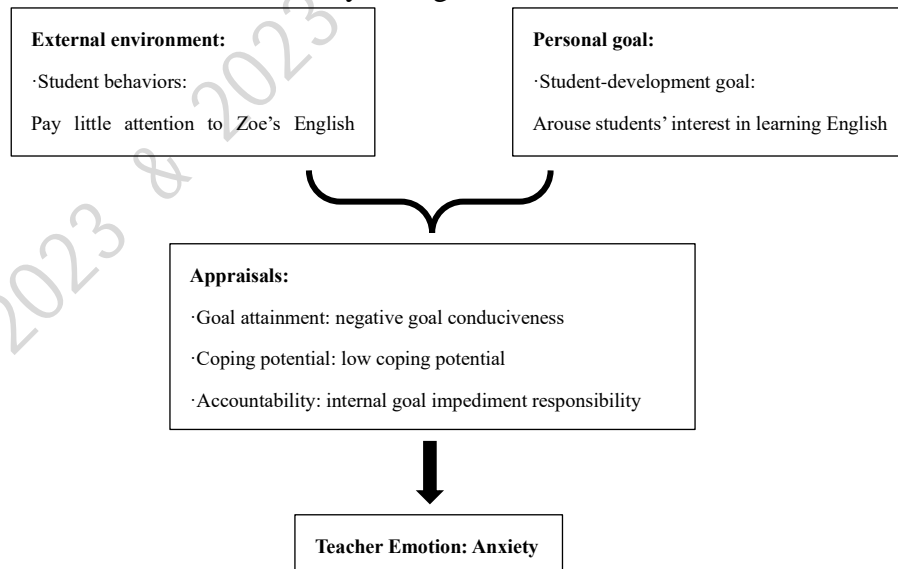


Figure 4. The appraisal pattern of Zoe's anxiety

5. Discussion

5.1 The comparisons of teachers' emotional experiences in Eastern and Western

China

The findings showed that College English teachers in Eastern China experienced more positive emotions than negative emotions in the blended teaching context, while teachers in Western China are on the opposite.

Table 4. Teachers' emotional experiences with frequency counts in Eastern and Western China

Themes-Sub-themes	Teachers in Eastern China	Teachers in Western China
<u>Positive emotions (34)</u>	22	12
Enjoyment (16)	8	8
Pride (11)	8	3
Gratitude (3)	3	0
Excitement (2)	2	0
Curiosity (1)	1	0
Hope (1)	0	1
<u>Negative emotions (31)</u>	15	16
Anger (9)	3	6
Anxiety (7)	5	2
Helplessness (6)	3	3
Disappointment (5)	2	3
Sadness (2)	2	0
Shame (2)	0	2
<u>Neutral emotions (7)</u>	4	3
Relief (7)	4	3
<u>Mixed emotions (3)</u>	2	1
Anxiety and excitement (2)	2	0
Hope and anxiety (1)	0	1

Obviously, teachers in Eastern China experienced more positive emotions than teachers in Western China, while experienced fewer negative emotions than teachers in the West. This echoes previous research in that teachers' emotions are culturally specific (Mesquita, Leersynder, & Albert, 2014). Due to the differences in sociocultural backgrounds between the east and west of China (Tong, 2003), teachers in east and west of China experienced different emotions.

Among positive emotions, it should be noted that enjoyment was experienced most frequently by teachers in east and west China. The prime triggering factor of their enjoyment is the advantages of the blended teaching model implementation, such as making up for the limited offline learning time, increasing learning resources, providing convenience for students and teachers, enhancing teacher-student interactions, etc. These advantages reported by the participants in this study are in line with the common features of the blended teaching model (Halverson & Graham, 2019), including increased flexibility and personalization (due to diverse learning approaches), more opportunities for interaction, technical advantages, increased learning time and abundant learning resources. In addition, gratitude was reported by teachers in Eastern China three times, while not appeared in Western teachers' comments. Data analysis revealed that teachers in eastern China felt gratitude for their students' proactive assistance, their colleague's active cooperation, and the school

leaders' strong support. However, teachers in western China, taking Helen as an example, felt disappointed and helpless because her colleagues passively performed the teaching tasks rather than actively exploring the blended teaching model implementation. Furthermore, instead of offering to help, her students suffered from weak self-regulation, frequently breaking the deadline for submitting their assignments, giving rise to Helen's helplessness. Another teacher in Western China, Zoe, expressed her anger towards school authorities' unreasonable arrangements. She was forced by school authorities to take blended teaching model training, which was viewed by her as "very easy, unnecessary, and a complete waste of time". As a young teacher, Zoe was familiar with those basic technical operations, and she believed that the technology training should be optional and voluntary. This appears to be inconsistent with the previous studies that institutions should give more technology training to reduce teachers' negative emotions (Gu et al., 2022). It should be noted that the content of technology training should suit the teacher's needs and the arrangement of technology training should be optional and voluntary.

5.2 Understanding the emergence of teacher emotions from an ecological and appraisal-based perspective

As shown in this study, the emergence of teachers' emotions involves the interaction between teachers' internal personal goals and external ecological environments. In specific, the ecological environments of these College English teachers consist of four layers, including microsystem, exosystem, and macrosystem, and chronosystem. Placing teacher emotions into the chronosystem, we found that teachers' emotions may change over time, due to changes in life events and experiences brought by time that alter the relationship between the individual and the environment. Taking anxiety as an example, Tina, a College English teacher in Eastern China, felt anxious at the initial stage of the blended teaching model implementation, while her anxiety gradually decreased since she got more familiar with coping with technology problems, and she felt relieved due to the online platform improvements and its functional refinements, as well as technical staff's support. This is resonant with previous reports that teacher anxiety is an interactive, emotional and temporal psychological factor caused by the complex interactions between teachers and physical and virtue ecosystems at micro, exo and macro levels (Liu et al., 2022). In addition, it highlights the important role played by technology in influencing teacher emotion, which echoed previous research (e.g., Kruk et al., 2022; Gu et al., 2022).

In addition, this study implies that the appraisal-based approach is conducive to understanding the emergence of teacher emotions and provides empirical evidence in the Chinese context. Confirming Frenzel's (2014) study, our findings showcased that teacher emotions result from appraisals pertaining to their personal goals, and different appraisals combined may lead to different emotions. However, this study only explored the emergence of the four most frequent and typical emotions experienced by the participants, including enjoyment, pride, anger, and anxiety. Future research could focus on other emotions and make detailed comparisons, for example, exploring the emergence of disappointment, sadness, gratitude etc.

6. Conclusions and Implications

This paper reports on four Chinese College English teachers' emotions in the blended teaching context with reference to the ecological perspective and appraisal-based approach. It shows that these College English teachers experienced four ranges of emotions, namely, positive emotions, negative emotions, neutral emotions and mixed emotions, with positive emotions experienced the most. In addition, this study contributed to unraveling the mystery of the emergence of College English teachers' emotions in the Chinese blended teaching context. Teacher emotions are elicited based on teachers' appraisals concerning their personal goals. In specific, teachers have certain key goals they strive to attain in the blended teaching context, and they continually make judgments pertaining to those goals based on their perceptions of the external environment (including microsystem, exosystem, and macrosystem), and various appraisals combined resulted in different emotional experiences. In specific, enjoyment is elicited from positive goal attainment; pride emerged from positive goal attainment and internal goal attainment responsibility; anger emerged from negative goal attainment and external goal impediment responsibility; and anxiety is elicited from goal consistency or conduciveness, teachers' low coping potential and internal goal impediment responsibility. This study enriched our understanding of the emergence of teacher emotions in the blended teaching context.

This study provides the following implications at personal, micro, exo, and macro levels regarding ways to cope with College English teachers' emotional experiences. At a personal level, teachers should seize the opportunities to develop their technology-enhanced instructional skills to cope with potential challenges attached to technology. At a micro level, proper guidance and supervision should be offered to students, so that students can get rid of their misbehaviors and cooperate with their teachers. At an exo level, school authorities should not only provide financial and technological support to the teachers but also release more autonomy to teachers in blended teaching model implementation. At a macro level, the designers of online teaching platforms should take into account teachers' goals and needs when developing the functions of platforms. Meanwhile, they should endeavor to avoid the instability and breakdown of online platforms.

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The sound of thought: A multimodal corpus of critical thinking in foreign language teaching classrooms

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Abstract

Multilingualism in China's higher education is evolving as university students are expected to engage with more than one foreign language in increasingly globalized contexts. While the new learning goal of high proficiency in one foreign language (L2) and basic competence in others (L3s) begins to reshape the foreign language teaching (FLT) programs in Chinese universities, coordination and collaboration across the languages involved have not yet been systematically explored. Focusing on the shared strategic objective of developing students' critical thinking in FLT practices, we began to compile a multimodal corpus, currently of 40 speeches, 40 presentations, and 40 dialogues, collected from the FLT classrooms of a comprehensive university, where an integrated FLT program offers undergraduate courses of 12 languages. The corpus data are video recordings of students speaking critically in their L2 (English) or L3 (Japanese), the verbal and non-verbal features of which were annotated to distinguish various cognitive processes and different types of knowledge. Our findings reveal the practical necessity and great potential to coordinate multilingual FLT methods, with critical thinking development being a sweet spot to explore the approaches, designs, and procedures in L2 and L3 classrooms, and thereby to make fruitful coordination and collaboration happen in a systematic way. Pedagogical practices informed by our corpus data have received encouraging feedback, based on which we are planning more fine-grained annotation schemes and preparing data of other languages from the same FLT program.

Keywords: Multilingualism; Foreign Language Teaching; Critical thinking; Revised Bloom's Taxonomy; Multimodal Learning Analytics

Introduction

The benefits of multilingualism to individual learners have been widely discussed over the past six decades, including its effects on language learning, intelligence, cognition, mindset, identity construction, etc. (Diamond, 2010; Haukås, Storto, & Tiurikova, 2022). Despite the inconclusiveness of some ongoing debates, the economic, social, and political needs in the globalization process have gradually justified the value of multilingualism and have substantially promoted government policies on and investments in multilingual education (Gao & Zheng, 2019; Cui & Liu, 2021). In

China, university students are now expected to achieve high proficiency in one foreign language (L2) and basic competence in others (L3s). The expanded teaching and learning of languages other than English (LOTEs) has added to the rich tapestry of foreign language teaching (FLT) in Chinese universities, raising the prospects of multilingual development for a significantly wider range of students. Such prospects, if sustainable, may profoundly influence China's economic and social progress in the new era of globalization. Challenges were identified, however, when non-English foreign language degree programs grew drastically in Chinese universities between 2000 and 2017, and "carefully coordinated efforts" were called for (Han, Gao, & Xia, 2019). The same concern applies to the recent development in multilingual education boosted by the Belt and Road Initiative, where the coordination and collaboration across the languages involved have not yet been systematically explored.

While coordinated efforts in multilingual education can be triggered in different ways, we perceive critical thinking development as a sweet spot, considering that good thinking is "an avowed aim of education" (Pithers & Soden, 2000) and that in language teaching students "develop and apply their thinking skills in situations that go beyond the language classroom" (Richards & Rodgers, 2014). Theoretical frameworks have been proposed to describe the dimensions, elements, and standards of critical thinking (e.g. Bloom, 1956; Facione, 1990; Paul & Elder, 2019), as its instruction and assessment require careful design and implementation, and students' competence and performance in this regard need to be further distinguished (Dong & Chang, 2023). The revised version of Bloom's Taxonomy (RBT) was advanced, over 40 years after the original framework, based on an increased understanding of educational objectives (Anderson & Krathwohl, 2001). It is visualized by a Taxonomy Table, where the interrelationships between the cognitive dimension (i.e. *Remember, Understand, Apply, Analyze, Evaluate, and Create*) and the knowledge dimension (i.e. *Factual, Conceptual, Procedural, and Metacognitive*) are made clearer and thereby widely used to describe, understand, and organize educational objectives, instruction, and assessment. Hence we adopt this framework to investigate critical thinking development across different FLT classrooms.

Empirical research on critical thinking in FLT mainly drew on writing samples (e.g. Stapleton, 2001; Dong & Chang, 2023) or standard tests (e.g. Floyd, 2011; Lun, Fischer, & Ward, 2010) to make an argument (for instance, students' varying performances of critical thinking in L1 and L2). Self-reflection essays or interviews were commonly included as well to evaluate the validity of the findings. In contrast, the enactment of critical thinking in real-world FLT classrooms have barely been systematically investigated and compared.

Aiming to closely observe the new tapestry of multilingual education in Chinese universities and hence enable unified efforts towards more common goals, we began to compile a multimodal corpus with critical thinking being the learning construct of interest (Ochoa, 2022). Video recordings of classroom activities (e.g. speeches, dialogues, and presentations) were collected, in which multimodal data traces manifest how critical thinking was involved when students/instructors acted or interacted with others in FLT classrooms. As the first multimodal corpus-based attempt to analyze "the sound of thought", this study seeks to answer the following research questions:

- 1) How are different FLT courses fostering university students' critical thinking competence?

2) Could the multimodal corpus data help improve students' critical thinking performance?
What other features can be extracted from the corpus data to better understand and thereby coordinate critical thinking development across FLT classrooms.

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Methods

Data collection

The present study inaugurates the project of building the multimodal corpus of critical thinking in different FLT classrooms of a comprehensive university, where an integrated FLT program offers undergraduate courses of 12 languages. The raw data are video recordings of regular classroom activities captured from two courses in English and one in Japanese, all offered to undergraduates from different disciplines.

English and Japanese courses were selected to pilot the project, due to the special role of the two languages in China's foreign language education and services (Cui & Liu, 2021). In addition, the popularity of Japanese as a second foreign language among university students in China was also considered. The two English courses focus on listening/speaking and reading/writing respectively, designed for students at the upper-intermediate or advanced level, while the Japanese course focuses on pronunciation/vocabulary/grammar, designed for beginners. Together, they exemplify the prevailing characteristics of FLT classrooms in contemporary Chinese universities. The corpus currently contains 40 speeches, 40 dialogues, and 40 presentations, details of which are shown in Table 1.

Data from the English Listening/Speaking course

There are more recordings from this course, as data traces of critical thinking can be directly and more frequently observed in its classroom activities. The 30 speeches, informative and/or

Table 1: Distribution of recorded classroom activities in the corpus

Courses	Activities	Topics	Participants	Data Units
English	Speeches	Academic & General	Students	<i>n</i> =30
Listening/Speaking	Dialogues	Academic & General	Student-Students	<i>n</i> =30
	Presentations	Academic	Students	<i>n</i> =30
English	Speeches	Academic	Students	<i>n</i> =5
Reading/Writing	Dialogues	Academic	Instructor-Students	<i>n</i> =5
	Presentations	Academic	Students	<i>n</i> =5
Japanese	Speeches	General	Students	<i>n</i> =5
Basics	Dialogues	General & Academic	Instructor-Students	<i>n</i> =5
	Presentations	General	Students	<i>n</i> =5

persuasive, were delivered by students of different disciplinary backgrounds on the same topic: What's Special about My Major? Accordingly, each speaker answered the questions raised by the other students, captured in the 30 dialogue recordings. By contrast, the 30 presentations feature students introducing an object, explaining a concept, or reflecting on their learning experience, with the help of diverse visual aids.

Data from the English Reading/Writing course

Although video recordings of classroom activities cannot fully capture students' critical thinking involved in courses of this kind (where reading and writing processes outside the classroom play an important part), we managed to include the most representative ones. The speeches in this course, less formal, are mainly responses to the content of teaching materials; the dialogues feature questions raised by the instructor and answered by the students; the presentations are the oral reports of group research.

Data from the Japanese course

Considering the language level of students, most classroom activities in this course are designed for general purposes but manages to unlock or exploit the potential of adult beginners. The speeches are mainly informative, in which each student presented a self-portrait with their limited repertoire of pronunciation, vocabulary, and grammar. In the dialogues, the instructor had greater chances to scaffold critical thinking by asking questions concerning the teaching materials or the Japanese language itself. The recorded presentations from this course are mainly picture-based, with students working in pairs and taking turns to describe an illustration of a scenario in the physical world.

Data analysis

The classroom video recordings were segmented into data units as Table 1 suggests. Low-level traces of critical thinking, verbal or non-verbal, left by the teaching and learning practices were examined and annotated using Version 6.5 of ELAN (2023). The process of annotation entails assigning each identified data trace to a specific cell within the Taxonomy Table (Anderson & Krathwohl, 2001), at the intersection of the corresponding column (the cognitive process dimension) and row (the knowledge dimension). One annotator coded the data from the English courses and another the data from the Japanese course, reaching agreement independently. An inter-rater agreement of 90 per cent has been achieved through discussion, and the intra-reliability tests are currently underway while this article draft is being prepared.

The occurrences, frequency, duration, and time ratio of different types of critical thinking annotated in the multimodal data were computed to give a tentative answer to Research Question 1. The distribution of annotations and the quality of students' performance were further assessed and interpreted to answer Research Questions 2 and 3.

Results

Details to be presented at the conference.

Discussion

Ochoa (2022) argued that Learning Analytics studies in the future will be predominantly and intrinsically multimodal as the learning process itself is. Our motivation for building a multimodal corpus to better understand “the sound of thought” resonates with Ochoa’s belief. Preliminary findings from our research have revealed the practical necessity and great potential to coordinate multilingual FLT methods.

A microscopic comparison between L2 and L3 classrooms

From a multimodal corpus to multimodal teaching and learning

“The sound of thought” across FLT classrooms

Future research

Details to be presented at the conference.

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Exploration and Practice of the Teaching Path of Senior High School English Reading Enabled by Internet + Technology

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Abstract: The ordinary high school English curriculum standard" points out that the ordinary high school English curriculum should attach importance to the modern information technology, make full use of information technology, promote the depth of information technology and curriculum teaching fusion, scientifically organize and carry out online hybrid teaching according to the characteristics of English learning under the information environment, and expand the curriculum resources as well as learning channels. So how to effectively apply information technology in English reading teaching? The writer take the foreign research (2019) version of the high school English compulsory1, unit2, understanding ideas module: "Neither pine nor apple in pineapple?" as an example so as to explain how to use information technology to help with English reading teaching. Through practice, it has been proved that the effective reading teaching activities with the help of the Internet play an important role in consolidating students' basic language knowledge, cultivating their logical thinking ability, promoting cross-cultural understanding and improving their comprehensive language use ability.

Key words: Internet technology; high school English, key competence

I. The current situation of high school English reading teaching

1. Low degree of informatization. The author investigates and studies the teaching of information technology in a middle school in this region, and finds that the use of information technology to carry out teaching still stays on the making of courseware, without in-depth exploration and development. Some teachers are seriously affected by exam-oriented education, and they still adopt the traditional mode to carry out teaching. The degree of informatization is very low, which cannot meet the learning needs of students. The main content of high school English teaching is "listening, speaking, reading and writing", which combines "Internet + education" with high school English teaching, and should be combined with the content of "listening, speaking, reading and writing". However, most of the English teacher rarely consider the "Internet + education" application of pertinence while in the application of Internet information technology, and some of them simply think that as long as the use of Internet information technology is used in the classroom teaching, it will be different from the traditional teaching mode, and then the information level of this class might be improved. In addition, English teachers will not carry out "Internet + education" special teaching for English reading content, and the application of computer is only stuck in the courseware on the multimedia screen. In addition, some English teachers are easy to ignore the students' acceptance ability and blindly instill the teaching resources to different degrees of students. No matter whether the students are on the same level, blind indoctrination will inhibit the motivation of students with learning difficulties.

2. Teachers' information literacy needs to be improved. Teachers' own ability to apply information technology determines the effect of information technology application in English reading teaching. With the continuous development of Internet information technology, a lot of reading materials can be downloaded on the Internet. However, in the actual process of high school English teaching, some high school English teachers have low information literacy and do not have too much time and energy to learn computer technology. In the final analysis, some English teachers still

believe that their teaching ability is stronger and will teach a group of good students with their years of working experience. Therefore, in the application of "Internet + education" to the construction of efficient classroom for English reading in high school, some excellent English teachers have poor teaching efficiency in efficient classroom due to their low computer level. Looking at the current middle school English teachers, all their concerns are still focused on this subject, completely ignoring the improvement of their own information literacy, which eventually leads to the stagnation of English teaching quality.

3. Extracurricular reading guidance is not enough. Middle school students are in the critical period of physical and mental development, and they have a strong curiosity and desire to explore the outside things. Due to the limited vocabulary of middle school students, they are not interested in reading. The new curriculum standard clearly requires that high school students' English vocabulary should reach 3000 / person, and relying solely on English classroom is far from meeting the requirements of the curriculum standard, so students must be guided to conduct extracurricular reading. Teachers should realize that the cultivation of students' good reading habits is a gradual process, and they should timely introduce extracurricular reading according to students' current cognition and interests. However, in the actual teaching, influenced by the heavy tasks, teachers rarely guide students to do extracurricular reading, which thus hinders the improvement of students' reading ability and prevents the formation of students' good reading habits.

II. The significance of the integration of internet technology and high school English reading teaching

1. Promote the orderly development of English teaching in middle schools. The arrival of the information age marks that China's education has entered the stage of information development. The development of internet-based technology and globalization has further enhanced the social status of English. Therefore, teachers should re-examine the English classroom, start from the students' interest, cognition and other aspects, and take effective ways to mobilize the students' enthusiasm and initiative in English learning. Using information technology to carry out English reading teaching is an inevitable requirement of teaching reform and development.

2. Implement the teaching requirements of the new curriculum standard. The new curriculum standard requires middle school English teaching should use information technology skillfully and broaden the channels for students to learn English and apply English. Using internet technology to integrate English teaching resources is helpful to improve students' English reading ability. Enrich the content and form of English teaching with the support of internet technology can not only create an English classroom atmosphere, but also expand the form of English teaching, and finally give full play to the potential of students.

3. Innovate the teaching mode of English reading and improve students' initiative in learning. The traditional high school English reading teaching pays more attention to teachers' teaching methods and teaching quality, and ignores the communication and interaction between teachers and students. English teachers under the background of "Internet +" are the guides of teaching activities, and their core mission is to constantly stimulate students' English potential and improve students' ability to internalize knowledge. With the help of the Internet, students can realize active learning and absorption, and truly build a student-oriented English reading class. In the high-quality English reading teaching class, English reading teaching is carried out in ways and materials that students are interested in, so as to effectively stimulate students' enthusiasm for English reading.

4. Give full play to the advantages of Internet resources to broaden students' knowledge of English reading. Under the background of the continuous maturity of Internet technology, English reading teaching needs make full use of the advantages of Internet resources and organize online English reading teaching combined with the content of teaching materials. Students can acquire high-quality English knowledge. If they encounter unfamiliar vocabulary and grammar in learning practice, they can use the retrieval function of the Internet to make students more convenient and reliable when referring to information and knowledge, and the teaching content of the website can meet the teaching needs and expand appropriately. Students should choose appropriate online reading materials and materials according to their personal conditions to meet the needs of students' learning and growth, and effectively enrich students' English reading vision and knowledge.

5. Break the space restrictions and build a harmonious English reading environment. The teaching method under the background of the Internet is a breakthrough in the traditional English reading teaching mode. Students can realize independent reading on the basis of their personal interests and preferences, which is no longer limited to traditional textbooks. English reading under the background of "Internet +" has the characteristics of privacy and integrity. Students do not need to read quickly in a tense classroom atmosphere. English reading supported by the Internet can make students feel its fun and charm, and fully stimulate their personal imagination and exploration ability.

6. Elaborate the value of information technology and promote the development of English teaching. With the help of "Internet +" technology, English teachers can organize online and offline integrated English reading teaching in an orderly manner, organize the subject integration mode and enrich English teaching resources, so as to improve students' core English literacy. By reading English and using the Internet to learn, students can master new learning methods, and constantly strengthen their own active learning ability. Traditional teaching methods are difficult to meet the needs of English talent training in the new era. In the future, the English requirement for talents is to have the core English literacy and lifelong learning ability. To obtain information and analyze problems in the form of reading does not mean that English reading is a rigid test training. Teachers should give full play to the value of information technology, integrate English teaching mode, provide new vitality for English reading teaching ways, and promote the development of English teaching.

III. The case of integration of internet technology-enabled and high school English reading

1. Content analysis and teaching objectives

This text is themed on Man and Self, involving human's language learning experiences. It is a vivid illustration of various "crazy" linguistic phenomena in English language, including the fun in learning English, the diversity in creating English language, and the cultural connotations hiding in English expression.

The writer introduces irregularities and illogicalities in English language, hoping to make readers be aware of the diversity and creativity of English language, to understand the cultural connotations behind English vocabulary, and to connect to their own English learning experiences. The following teaching objectives are set according to the concept of the new curriculum standard:

Table 1: Teaching objectives

Language Competence	1. Name types of word formation like compounding, derivation, conversion and abbreviation and learn to distinguish from one to another.
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	2. Identify the text features of argumentative essay and apply the textual structure to express views on English learning or other topics.
Learning Ability	1. Choose appropriate learning strategies to self-monitor and adjust their language learning habits. 2. Actively cooperate with others and exchange ideas.
Thinking Capability	1. Guess the theme by predicting from the title or key information. 2. Conclude the text structure and produce similar ones according to the same logic of presenting.
Cultural Awareness	1. Promote learning interest in exploring English language and lay a foundation for future English learning. 2. Compare English with Chinese to cultivate the awareness of inter-cultural communication.

2. Teaching ideas

Table 2: Teaching ideas

5E teaching modes	Teaching activities	Purposes
Engagement	Word formation puzzles	Activate Ss's knowledge, connect to their prior reading skills and inspire them to think.
Exploration	Read for statement	Motivate further learning; Arouse their interest in language exploring .
Explanation	Read for information	Develop specific skills in reading; Foster students' group cooperation.
Elaboration	Read for structure	Develop students' ability to understand and process, extract and summarize the writing structure.
Extension	Read for writing	Draw a conclusion and achieve the lesson goals

3. Specific teaching design

Based on the analysis of the teaching content, students' learning situation, teaching objectives and other factors, the teaching steps and design of using internet technology in the classroom are now explained:

- **Pre-reading: Warming up(3mins)**

As the saying goes, a good beginning is half-done. Therefore, the importance of classroom introduction to a class is self-evident. How to make this class interesting without overwhelming? Considering the nature of students, the author stimulates students' interest in the form of guessing words. Since this article involves the method of word formation, the author has selected some interesting ones. And the common English vocabulary to arouse students' interest, so as to trigger students to think about

the differences in the above vocabulary. The correct group can add one point each time through the Shivo whiteboard to answer.

➤ **[Design intention]** By the way of "word formation puzzle" can greatly arouse the enthusiasm of students to participate in the classroom, what's more, the selected vocabulary from this unit requires Students to master these vocabulary, they have been familiar with the vocabulary and phrases of this unit in the independent preview link, so by guessing the word link for static knowledge, their schema can be consolidated, and it also pave the way for the next task.

● **While-reading: Exploration(5mins)**

The skimming ability is one of the necessary abilities for students to read English. The college entrance examination is often read in the form of general questions, and students need to choose the correct choice in a short period of time. Referring to the form of college entrance examination reading, the author also set the skimming choice questions of this course, as shown below:

Q1: How does the writer support his statement?

- A. By providing examples.
- B. By making comparisons.
- C. By following the order of time.
- D. By following the order of space.

Due to the limitations of large class teaching, it is difficult to test the correct rate of each student. In order to solve this problem, the author uses the test function of questionnaire star, teachers set the questions and options before class, and send the questions through the QR code. Students only need to scan the QR code, fill in their name through the QR code, and select the appropriate option in the ABCD to submit it. Teachers can check the accuracy of students' questions in real time through the web page.

➤ **[Design intention]** The use of the questionnaire star is convenient for teachers to check the students' questions in real time and solve the questions pertinently, which greatly improves the teaching efficiency.

● **While-reading: Explanation(15mins)**

In this text, the author set the topic of the general idea of the paragraph, as shown below, scanning is another reading ability that students need to master. The teacher analyzed this statement and supporting methods and explained keywords and expressions. Students are also asked to consider the following questions:

Q1: How does the writer connect the remaining paragraphs to his statement?

Q2: How does the writer support his statement?

In this question, the author adopted the classroom activity function in the white board, using the time for the class to scan the code to fill in the answer, and asked a student to demonstrate on stage. Students on stage only need to drag the paragraph in the left column with their fingers to the general idea of the paragraph corresponding to the right column. After completion, the check button will appear on the screen, which can check the correct and wrong.

➤ **[Design intention]** The connection function of Shivo whiteboard is helpful for students to show themselves, experience the fun of software interaction, and make the classroom more vivid.

Detail comprehension question is an important type of reading comprehension, accounting for the largest proportion in reading comprehension. The second and third paragraphs of this article list a large number of irregularities in English language, which are easy to be confused in the process of reading. Therefore, the author guides the students to read the first part, and then reads the puzzle through group cooperation

to complete the remaining paragraphs of the article. Finally, the students are asked to finish the last paragraph and answer, "How crazy is the English language?" "why?"



Read para.3-6 carefully and discuss in groups.

Para 段落	Examples 例证	Problems 问题
G1 2	sculpt a sculpture, take a photo; in the car or taxi, on the train or bus; seasick at sea, carsick in a car; homesick, homework, housework	是否使用同源宾语? 介词使用不固定? 词根相同意思不同? 词根意近而词意不近?
G2 3		
G3 4		
G4 5		
G4 6		

➤ [Design Intention] jigsaw reading is a novel teaching activity, through which students can more intuitively and easily find out key information and understand the original text more accurately.

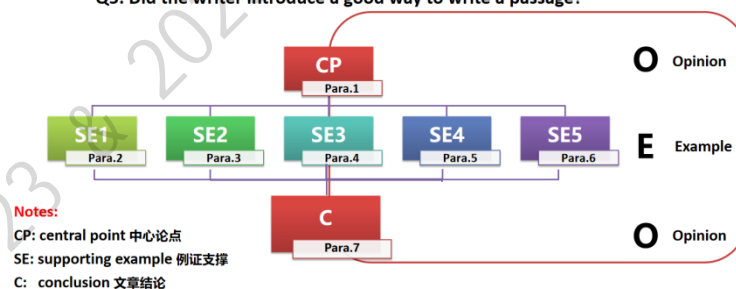
● Post-reading: Elaboration (8mins)

After global and detailed reading, the author led the students to comb and summarize the text structure, aiming to clarify the characteristics of the text. Then teacher asked: Did the writer introduce a good way to write a passage? At the same teacher present the text structure in the form of mind map, make the article more clear and intuitive, and improve students' logical ability on this basis.

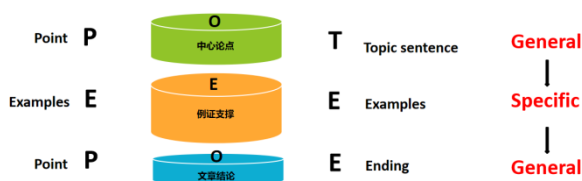


Comb the text structure.

Q5: Did the writer introduce a good way to write a passage?



Extend the writing structure.



观点论述类

论点明晰 论据充分 例证详实 首尾呼应

➤ [Design intention] Mind map mobilizes students' logical thinking ability, and enables students to master language knowledge and cultural knowledge in the activities. This method also applies to other details.

- **Post-reading: Extension (9mins)**

Based on the learned structure, the "OEO", "PEP" and "TEE" framework should be used to build a new scene to promote group discussion and writing on the topic of "talking about emoji". Conventional writing is often written by the students and handed over to the teacher for review, and when the teacher comments and then sent to the students, which often missed the best time to answer. In view of the limitations of traditional writing, the author introduced the software of high school English mixed writing platform to assist the teaching. Students can directly scan the QR code to enter the software. They learn writing knowledge by watching writing and other related micro lessons online, or take photos and upload compositions or type text directly. The software will automatically correct the composition, and mark words with grammatical or spelling mistakes, and provide appropriate correction suggestions.

➤ **[Design intention]** High school English mixed writing platform can timely feedback students' writing situation, convenient for students to review in time, but also reduce the workload of teachers to a certain extent, and improve teaching efficiency.

Finally, students are required to scan the QR code after class, watch the English teacher's self-made micro class to further learn the content of word formation, consolidate the knowledge of this lesson, and complete the special practice of word formation.

➤ **[Design intention]** Teachers use micro-lessons to assist students to consolidate and review after class, and to fill the gaps for students. In addition, it can activate the teaching atmosphere, enhance students 'initiative in English learning, and constantly improve teachers' teaching ability.

IV. The strategies of Internet technology-enabled high school English reading teaching

1. Strengthen English reading learning before class

Teachers need to assign the preview task of English reading for students in the pre-class stage, guide students to have a preliminary understanding of the teaching content, give full play to their own guiding role, and help students to realize the penetration of reading and learning. At the same time, teachers also need to give full play to the advantages of information technology in the lesson preparation stage, focus on the teaching knowledge points in the teaching plan, using small videos, pictures and other multimedia forms to stimulate students' enthusiasm for learning, which will help students better understand and remember related English reading knowledge, so as to effectively improve the classroom efficiency. For example, complete the process of making micro-lessons through multimedia, and guide the students to watch before class. In the early stage, students can form a preliminary cognition of the teaching content based on the micro-course auxiliary teaching means, and then enhance their mastery of knowledge in the classroom teaching stage.

2. Enhance classroom communication in English reading

According to the survey, the communication between students can easily arouse the collision of thinking and help students realize the in-depth exploration and excavation of reading knowledge. After the students complete the learning exchange, the teacher can guide each group to elect a leader to make a comprehensive summary of what they have learned, and point out that the problems in the reading learning stage, then pave the way for the implementation of the communication between teachers and students. The problem-introduction communication can not only effectively mobilize students 'awareness of independent learning, but also have a certain positive impact on exercising students' thinking and active classroom

atmosphere. In addition, teachers also need to timely track the progress of students' micro-lessons in the preview stage, fully understand the differences of students in learning, and lay a good foundation for the subsequent implementation of personalized teaching.

3. Build an English mind map to improve students' learning efficiency

The construction of mind map is helpful for students to clarify their thinking and framework of the article, and to produce scientific cognition of the plot and subject of the article. Based on this, high school English teachers need to give full play to the role of mind mapping in reading teaching, sort out and feel the author's thoughts in the progressive process, and improve the quality of English reading teaching. At present, high school English teachers do not have enough application depth and enough guidance to students. The clever use of mind mapping can improve students' logic and thinking ability. Through the construction of mind mapping, students can gradually help to develop good learning and reading habits, and the quality of English reading can be greatly improved. Based on the wide application of mind mapping mode in English class, students can sort out the context and ideas of the article, systematically understand the methods and steps of reading, find the key points of reading, and master the learning skills, so as to further improve the quality of English reading.

4. Optimize the after-class evaluation and consolidate the basic knowledge

The effective application of the after-class stage can help the students to complete the re-cognition of the teaching content on the basis of the existing knowledge, and then realize the effective consolidation of the knowledge. In this regard, teachers should attach great importance to students' classroom situation and the completion of learning tasks, form a correct evaluation of the teaching situation by digging into students' common problems, and give positive guidance to students' independent and cooperative learning, so as to promote students to make a comprehensive summary of the reading content and reading strategies.

Conclusion

With the popularization and promotion of internet technology in the field of education, English teachers should adapt to the development needs of the times, seek the convergence point between internet technology and English teaching, make use of many advantages of internet technology to serve English teaching, and use the new classroom teaching pattern created by information technology to improve students' interest and ability in English learning. In the "Internet +" technical support, combined with class practice, the writer choose high school English reading teaching, attempts into digital interaction between teachers and students, information evaluation means, instant evaluation, etc., starting from the dimensions of reading resources, teaching methods, and reading evaluation, information technology elements are consciously embedded in teaching, so as to play the enabling role of "Internet +" in reading teaching, in order to reform the traditional English reading teaching mode, improve the reading teaching methods, and promote the further innovation of teaching and learning methods. The exploration and practice of this lesson has proved that the reasonable and effective use of "Internet +" technology is not only helpful to play the students' dominant position in learning, but also conducive to stimulate students' interest in reading, enhance the effectiveness of English reading teaching, and inspire teachers to think more about English teaching under the background of the new curriculum standard. Finally, under the guidance of the teaching concept of the new curriculum standard, teachers should not only change their teaching concept in time

and learn information technology hard, but also actively explore the innovative integration mode of internet technology and English reading teaching, so that internet-enabled technology can better serve English reading teaching.

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The impact of ChatGPT on Chinese EFL learners' willingness to negotiate and engagement

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1. Introduction

In the era of globalization, English has become a lingua franca in international communication, necessitating learners to develop communicative competence. Particularly, Chinese learners of English as a Foreign Language (EFL) are compelled to hone their communication skills. One of the pivotal aspects of communication is negotiation, a specialized form of communication that encompasses problem-solving, reaching agreements, and collaboration through interactive discussions (Cohen, 1991). The negotiation process in language learning entails learners clarifying and comprehending meaning, which is integral for developing communicative proficiency (Pica, 1994).

Chinese EFL learners often grapple with limited exposure to authentic English-speaking negotiation contexts, inhibiting their willingness to negotiate in English. Learners' willingness to negotiate is affected by factors such as anxiety, fear of making mistakes, and peer evaluation, similar to their willingness to communicate (WTC) (Peng, 2019). However, negotiation requires more specific cognitive and communicative skills, as it involves intricate conversations, including asking questions, seeking clarifications, and providing explanations (Long, 1983).

Emerging technologies like artificial intelligence and natural language processing have enabled the creation of conversational agents, such as ChatGPT, which can mimic human-like conversations. ChatGPT's potential to support communication is significant, as it provides learners with an interactive and stress-free environment for practicing English. Such environments are conducive to increasing learners' willingness to communicate and, by extension, their willingness to negotiate (MacIntyre et al., 1998).

This paper aims to explore the impact of ChatGPT on Chinese EFL learners' willingness to negotiate and engagement. It will investigate how interaction with ChatGPT influences their readiness to engage in negotiation tasks and discussions, and how it may affect their overall negotiation skills. This study contributes to the growing body of literature on the integration of AI chatbots in language learning and specifically addresses a gap concerning negotiation, a crucial, yet under-researched aspect of communication.

2. Literature review

2.1 Chatbots in L2 learning

The domain of Second Language (L2) education has experienced a remarkable transformation with the incorporation of AI technology, including chatbots, virtual reality, and Automatic Speech Recognition (ASR) technology.

Chatbots, also called conversational agents, a computer program designed for

simulating conversation with human users (++)source). Conversational AI encompasses technologies that enable computers to engage in human-like dialogues through natural language processing, which includes chatbots and virtual assistants (++)source). ChatGPT, developed by OpenAI based on large language model, is capable of generating responses across a wide range of topics and remarkably fluent and human-like text. Automatic Speech Recognition (ASR) is a technology that converts spoken language into written text, and is often integrated with chatbots and conversational AI to facilitate voice interactions (Huang, Li, & Deng, 2014).

Advantages of using these technologies in L2 learning are abundant. Moussalli and Cardoso (2019) assert that the integration of AI and ASR technology in Intelligent Personal Assistants (IPAs), such as Google Assistant, has created an attractive and convenient platform for language learning. According to Kessler (2018), ASR in IPAs gives L2 learners myriad opportunities to practice speaking, thereby engaging them in diverse forms of interaction and developing their communicative competence. Barcomb et al. (2017) observed that IPAs promote listening and speaking skills as the accessibility, familiarity, and practicability of these devices enable learners to easily access content. Moreover, IPAs serve as virtual peers, delivering instant, personalized responses, which can foster self-directed learning and improve learners' control, motivation, and personalization of learning (Moussalli & Cardoso, 2019).

Another vital advantage is in the affective domain. Moussalli and Cardoso (2016) found that IPAs such as Alexa can make interactions comfortable and enjoyable, thereby motivating students to practice speaking and listening in a less intimidating environment. Sandeep (2019) similarly found that AI chatbot Alexa was viewed as a non-threatening conversational partner, making learners less anxious compared to conversing with humans.

However, these technologies also have certain disadvantages. For instance, chatbots and conversational AI sometimes fail to understand nuances, sarcasm, or cultural references, which are critical in language learning (Winkler & Söllner, 2018). This can lead to misunderstandings or incorrect language use. Additionally, students might develop a reliance on these technologies and lack opportunities to engage in real-life human interactions, which are essential for holistic language development. The emphasis has gradually transferred to communicating to smart technologies (++)source). CMC context is believed to enhance WTC and language learning.

2.2 WTC

WTC in L2 acquisition is defined as the likelihood of an individual choosing to initiate communication when free to do so (MacIntyre, Clément, Dörnyei, & Noels, 1998). Building upon the established dimensions of WTC, recent developments in technology have led to the proposal of an emerging dimension in L2 WTC, which involves Computer-Mediated Communication (CMC). CMC is defined as human-to-human communication through the use of computers or other technological devices (Thorne & Payne, 2005).

Regarding the trait-like WTC, conversational AI, available 24/7, provides ample opportunities for speaking and listening practice, which can stimulate more frequent

language use and consequently enhance WTC (Kessler, 2018; Moussalli & Cardoso, 2019). Communicating with a non-judgmental AI could also alleviate learners' fear of making mistakes or being ridiculed, which is often a critical barrier to language practice (MacIntyre, Clément, Dörnyei, & Noels, 1998). Chatbots can adapt to individual learner needs and preferences, offering a more personalized learning experience. This sense of control and personalized feedback can enhance motivation and self-efficacy, key factors in promoting WTC (Dörnyei, 2005; Lee & Hsieh, 2019).

Regarding situational WTC, interacting with AI can provide a safe environment for learners to try out new language forms and take risks (Sampson & Yoshida, 2020). Non-judgmental AI chatbots could alleviate learners' fear of making mistakes or being ridiculed, which is often a critical barrier to language practice (MacIntyre, Clément, Dörnyei, & Noels, 1998). AI chatbots are non-threatening and can be seen as private companions, which can reduce inhibition and improve communicative confidence (Sandeep, 2019).

2.3 Student engagement

In the context of second language (L2) learning, student engagement refers to the degree to which students actively participate in and commit to their language learning process. This includes involvement in L2 activities, investment of time and effort in learning tasks, meaningful interaction with peers and teachers in the target language, and a proactive approach to enhancing their language proficiency and intercultural understanding (Wang & Derakhshan, 2021). The concept encompasses three interconnected dimensions, behavioral, emotional, and cognitive (Reeve & Tseng, 2011).

In communication activities, behaviorally engaged students demonstrate active participation in learning and communication activities, such as taking part in discussions and collaborative tasks. Emotionally engaged students show interest, enjoyment, and a sense of belonging, which are crucial for maintaining motivation in communication tasks. Cognitive engagement refers to the extent to which students invest in learning, involving self-regulation, and a deep approach to learning (Fredricks et al., 2004).

Research on student engagement is critical because it provides insights into how to design more effective learning experiences and environments. Engagement serves as a proxy for the quality of learning experiences and could predict academic achievement (Carini, Kuh, & Klein, 2006). It also helps educators and researchers to understand the complex interplay between the learner, the learning context, and learning outcomes. It guides the development of pedagogical strategies to foster engagement, including the integration of technology in language learning.

2.4 Negotiation and Chinese L2 learners

Negotiation is a process where two or more parties with varying needs and interests engage in a dialogue to find a mutually acceptable resolution (Fisher, Ury, & Patton, 2011). This dialogue is often centered around an issue or a series of issues and the process aims to resolve conflicts, settle differences, and reach a consensus.

Negotiation contexts can be multifaceted and range from business transactions to international diplomacy to personal relationships. Each context comes with its own unique characteristics, which can significantly impact the process, strategies used, and the outcomes of the negotiation. Negotiation types can be divided into two main categories: distributive negotiation and integrative negotiation. Distributive negotiation, also called bargaining or "win-lose" negotiation, is characterized by a fixed amount of value that must be distributed or divided, hence often leads to competitive negotiations. On the other hand, integrative negotiation, also called collaborative or "win-win" negotiation, focuses on creating value where all parties can gain and meet their objectives. The nature of the negotiation and the relationship between parties often determines which approach is more suitable (Lewicki, Barry, & Saunders, 2015).

Chinese negotiators are known for their holistic, indirect, and relationship-driven negotiation style (Leung, 1997). They typically rely on a collectivist approach, with strong emphasis on building long-term relationships (*guanxi*), saving face, and achieving mutual benefit (Pye, 1992). Unwillingness to negotiate may arise when they perceive that the negotiation might lead to loss of face, either for themselves or the other party (Zhu, McKenna & Sun, 2007). They may also avoid negotiations that can potentially disrupt existing relationships or create imbalances in harmony. Moreover, when they feel the deal is heavily skewed or unfair, they might choose not to engage in negotiation.

Research has found that Chinese negotiators often perform better in distributive negotiations than in integrative ones. This can be attributed to their tendency to use a contending strategy (Zhu et al., 2007). However, this does not mean that Chinese negotiators cannot be successful in integrative negotiations. Their emphasis on relationship building can be a strong asset in such scenarios. They value mutual gain and look for solutions that are beneficial to all parties, aligning with the goals of integrative negotiations (Leung & Tjosvold, 1998).

As an integral part of the L2 learning process, when students participate in negotiations, they acquire more than just linguistic proficiency. This experience enriches them with essential interpersonal competencies, including active listening, precise articulation of viewpoints, and conflict management abilities. However, traditional negotiation often encounter several challenges. Negotiation skills, like many other complex tasks, require repeated practice and feedback, which is often not feasible in a conventional classroom setting. The asymmetrical level of language proficiency may further lead to imbalance, as some may dominate the conversation, leaving others with limited opportunities for engagement (Kolb, 2004). Anxiety and fear of judgment often deter students from actively participating in negotiations, especially among non-native English speakers.

We suppose the adoption of ChatGPT in negotiation sessions hold great potential in overcoming the constraints inherent in conventional classroom settings. ChatGPT is likely to provide unlimited opportunities for students to practice negotiation and practice in low-pressure environment, promoting more open and expressive exchanges (Radford et al., 2019). As negotiation remains a vital yet under-researched

aspect of communication, understanding the potential role of ChatGPT as a negotiation assistant could significantly inform future advancements in teaching negotiation skills in the EFL context and AI technology adoption in language pedagogy. Accordingly, the following research questions will be addressed:

1. What is the impact of ChatGPT on Chinese EFL students' willingness to negotiate?
2. What is the impact of ChatGPT on Chinese EFL students' engagement in negotiations?
3. What are students' perceptions of using ChatGPT as a virtual negotiator to support learning?

3. Research method

3.1 Digital transformation of materials for simulated negotiation

The simulation materials are transformed into suitable prompts for ChatGPT. The prompts are designed to encapsulate role, background, objective, and starting conversation, providing the AI with all necessary details to participate effectively in the negotiation simulation. We employed tools such as OpenAI's ChatGPT Playground and Jina.ai to refine and perfect the prompts. The prepared prompts are then fed into ChatGPT. TalkBerry, an advanced text-to-speech (TTS) tool, is adopted to support students' voice input and ChatGPT's response, enhancing human-like, oral communication.

Four negotiation cases are designed as shown in the table. 2 are distributive negotiation cases and 2 are integrative cases.

3.2 Research design

We invited 57 students who are intermediate-to-high level English learners (equivalent to European framework of English level B1) to participate in the study. The participants were enrolled in a course aimed at improving their negotiation skills.

This research employed a within-subjects design, where all participants experienced both negotiating with human peers and an AI chatbot, specifically ChatGPT. Participants were randomly assigned to one-on-one groups to perform four negotiation tasks (two distributive and two integrative tasks) with their peers. Subsequently, the same participants negotiated with ChatGPT in four similarly structured tasks (two distributive and two integrative).

The negotiation tasks were designed to cover major negotiation issues, with particular attention to simulating real-world negotiation scenarios as closely as possible. Participants' roles in the negotiation tasks were randomly assigned to ensure fairness and minimize bias.

4. Preliminary findings

4.1 Analysis of Behavioral Engagement

A paired t-test was conducted to compare the level of behavioral engagement in Human-Human and Human-AI conditions. There was a significant difference in the scores for Human-Human ($M=3.42$, $SD=0.54$) and Human-AI ($M=4.67$, $SD=0.51$) conditions; $t(55)=-13.04$, $p < .001$. These results suggest that the students were

significantly more behaviorally engaged when negotiating with AI compared to their human counterparts.

Further, when comparing behavioral engagement across different types of tasks, there was a significant difference in the scores for Competitive tasks ($M=3.64$, $SD=0.54$) and Cooperative tasks ($M=4.45$, $SD=0.51$); $t(55)=-7.48$, $p < .001$. This indicates that regardless of the negotiation partner, students demonstrated higher behavioral engagement during cooperative tasks than competitive tasks.

4.2 Analysis of Emotional Engagement

A paired t-test was performed to compare emotional engagement in the Human-Human and Human-AI conditions. There was a significant difference in the scores for Human-Human ($M=3.23$, $SD=0.60$) and Human-AI ($M=4.71$, $SD=0.52$) conditions; $t(55)=-11.83$, $p < .001$. These findings suggest that students were more emotionally engaged when negotiating with AI.

In comparing emotional engagement across different types of tasks, there was a significant difference in the scores for Competitive tasks ($M=3.53$, $SD=0.60$) and Cooperative tasks ($M=4.41$, $SD=0.52$); $t(55)=-7.08$, $p < .001$. Thus, irrespective of the negotiation partner, students displayed higher emotional engagement during cooperative tasks than competitive tasks.

4.3 Analysis of Cognitive Engagement

A paired t-test was applied to compare cognitive engagement in the Human-Human and Human-AI conditions. There was a significant difference in the scores for Human-Human ($M=3.48$, $SD=0.58$) and Human-AI ($M=4.81$, $SD=0.53$) conditions; $t(55)=-11.15$, $p < .001$. The results suggest that students exhibited higher cognitive engagement when negotiating with AI.

In the comparison of cognitive engagement across different types of tasks, there was a significant difference in the scores for Competitive tasks ($M=3.75$, $SD=0.58$) and Cooperative tasks ($M=4.54$, $SD=0.53$); $t(55)=-6.72$, $p < .001$. This pattern aligns with the behavioral and emotional engagement results, suggesting that irrespective of the negotiation partner, students were more cognitively engaged during cooperative tasks than competitive tasks.

In conclusion, these findings suggest that students demonstrated higher levels of behavioral, emotional, and cognitive engagement when negotiating with AI compared to their human counterparts. Furthermore, cooperative tasks appear to stimulate higher levels of engagement than competitive tasks, regardless of whether the partner is a human or AI. This illuminates the potential benefits of incorporating AI-assisted negotiation tasks in enhancing students' engagement in EFL learning. Further research could explore the specific elements of the AI interaction that contribute to this enhanced engagement.

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Exploring the Utilization of Artistic Elements in Conveying the "Image" of Ancient Poetic Works

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Abstract:

Sketching ancient poems are an essential part of Chinese language teaching materials, and is also the main teaching means to improve students' cultural connotation and aesthetic ability. The present study posits that the teaching of ancient poems constitutes an indispensable component of Chinese language education and serves as a primary means of enhancing students' cultural comprehension and aesthetic capability. Despite its importance, students have historically encountered difficulties both in reciting ancient poems and comprehending their themes. A fundamental deficiency in students' understanding of the "images" conveyed in these poems underlies these challenges, making the teaching of these images a critical issue in the teaching of ancient poems. In light of this, the implementation of art-based pedagogy to impart the "images" of ancient poems to students has been proposed to facilitate memorization and consolidate the students' understanding of these images through the incorporation of related theories. Ultimately, this study is also enabled to enhance the effectiveness of the teaching of ancient poems.

Keywords: Ancient Poetry Teaching; Image; Art Means; Coloring Game

1. The Soul of the Teaching Ancient Poem - "Image"

Sketching ancient poems are a vital teaching content in the stage of compulsory education, and "image" teaching is one of its key and difficult points. *Chinese Curriculum Standards for Compulsory Education* clearly points out the teaching objectives of the fourth stage of compulsory education: "reciting ancient poems, reading plain Classical Chinese, and being able to understand the basic content with the help of annotations and reference books." Among the Chinese textbooks for middle schools in mainland China, the most widely applicable editions are the PEP edition and the Partial edition compiled by the central government in 2016. Both editions pay great attention to the teaching of ancient poems. A total of 70 ancient poems have been selected in the PEP edition, of which sketching poems account for the most. The number of selections in the Partial edition is almost the same. Ma Zhiyuan's (1250-1321) *Tianjingsha · Qiu Si*, Li Bai's (701-762) *Moon Song on Mount Emei*, Han Yu's (768-824) *Late Spring*, Liu Yuxi's (772-842) *Autumn Poems* and other sketching ancient poems have all become popular selections among students of a generation. As an essential part of Chinese teaching materials, drawing ancient poems' images is the core element of the poet's creation. Critic Li Xiaoquan (birth and death unknown) once said: "Poetic image is a symbolic representation of the unity of subject and object of the poet's feelings and thoughts, which is carefully constructed by the poet to express certain aesthetic

ideals or thoughts in the process of creation."¹ If the students have little knowledge of the scene "image" of the ancient poems, they will be at a loss when digesting the theme and reciting the content. At present, many students have difficulty in grasping the theme of ancient poems and memorizing them because of the obscurity of the image. Some students even have depression, rejection and other negative psychology in the study of ancient poems.

"Image" has long been defined by ancient philosophers in both China and the West. Wang Bi (226-249), a Chinese philosopher, said in his book *Zhou Yi Example· Ming Xiang*, "The sage uses the image to fulfill his meaning", "the image is born from the meaning, so that the image can be found to observe the meaning". In the Northern and Southern Dynasties, Liu Xie (465 -- 532), the author of the *Wen Xin Diao Long*, first applied the concept of "image" to poems. He had the concept of "Look at the image to carry the axe" in poem creation. And the modern critics for the ancients to attach importance to the "image" of the creation tradition is highly affirmed. Chen Liangyun (1940-2008) believed that "poems with 'image' can more accurately express the aesthetic psychological activities of poets in the process of composing the poem and the forms and modality presented in the poem, and also more accurately express the aesthetic pleasure that readers get when reading and appreciating the poem."² But poets have their own criteria when choosing "image", and not all words can be labeled as "image". For the creation of poets, only words that can convey their feelings can be selected as "images". The biggest difference between "images" and ordinary words is to extract and convey the emotions of poets. Pound (1885-1973) defined the "image" in his article *An Imagist's a Few Don'ts* as "something that presents the complex of reason and emotion at the moment"³. Fletcher (1896-1950) also said that "'image' is the relationship of emotions in form, color and sound."⁴ The "image" in ancient poems is the poet's main tool to convey emotion to the outside world. Only by understanding "image" can the reader understand the mood of the poet, as well as the thematic ideas expressed by him.

The "images" in ancient poems possess an inherent emotional logic. Unlike ordinary linguistic units whose purpose is served once the meaning is conveyed, the "images" in ancient poems are emotional symbols employed by poets to express their emotions in a purposeful manner. There exists a strong emotional logic between the "images", which the poet utilizes unconsciously to connect them. The poet employs "images" as the means to construct their poems, rather than relying on language alone. As Pound observed, "Imagery is a language beyond formulaic", and the imagist poet Hume further argued that "direct language is poems" as poems deal with "images". Poems are therefore imbued with life, as they are constructed through the creation of "images" that serve as the medium for the expression of the poet's emotions. By presenting unique symbols of "images" to readers, poets facilitate reader empathy, which in turn makes the theme of the poems easier to comprehend and accept.

¹ Li Xiaoquan. Comparison of Image Categories between Chinese and Western Poetics [J]. *Journal of Qingdao University*, 2004:67.

² Chen Liangyun. On the System of Chinese Poetics [J]. *Cultural Heritage*, 1986.

³ Peter Jones. *Imagist Poems • Introduction* [M]. Translated by Qiu Xiaolong. Guangxi: Lijiang River Publishing House, 1986:44.

⁴ Peter Jones. *Imagist Poems • Introduction* [M]. Translated by Qiu Xiaolong. Guangxi: Lijiang River Publishing House, 1986:45.

Middle school students are in a transitional phase of understanding "images". According to Piaget's Cognitive-developmental theory, middle school students (Aged 12-15) are undergoing a transition from concrete to abstract thinking. During this stage, students become increasingly aware of their own thought processes, a phenomenon Piaget referred to as "meta-thinking". If shown an image, a student at this stage of development will not only be curious about the subsequent image but also reflect on the connections between the images. This is not only a process of simple memory or association, but also a self-conscious critical process that enables students to mobilize their thinking abilities to integrate and analyze the materials at hand. The experiment conducted by Chinese educator Zuo Menglan and others in 1990, "children's memory and images", demonstrated the validity of Piaget's theory of cognitive development. The researchers showed images to students aged 5-13 and observed that, after being exposed to the images, the students consciously utilized "meta-thinking" to recall the pictures. The study also found that older students performed better in the experiment, with memory development in geometric images being more significant after entering middle school. Based on this theory, the crucial role of "meta-thinking" in teaching ancient poetry to middle school students should be emphasized. By employing art methods to help students reshape the "image" picture, teachers can not only aid their memory but also encourage them to think actively about the relationship between the "image" and the theme's meaning.

2. The Lines, Compositions, and Colors of "Image"

The "image" of ancient poems mainly comes from the visual beauty of natural scenery produced by the poet, and the image is the main form of visual beauty. Human beings are highly sensitive to vision, and visual images are the easiest to enter the elements of human memory. We live in a vast cosmic ecosystem, and we are responding to the outside world all the time. Among many senses, vision and hearing are the most important and should be used by researchers. In the field of ancient poetry teaching, some outstanding scholars have taken the lead in proposing to improve the efficiency of ancient poetry teaching through the music beauty of "chanting".⁵ In terms of vision, Toshio Yamanaka (birth and death unknown) established a "psychological model of sensation and perception" (as shown in Figure 1). He believed that through color stimulation, color sensation and color perception, people's feelings and cognition are triggered, thus becoming memories. Hegel (1770-1831) also said: "Color sense should be a quality held by artists, is their unique ability to grasp the color and color conception, so it is also the basic factor of imagination and creativity of reproduction."⁶

⁵ Ding Yidan. Attaching Importance to Poetry Reciting and Carrying Forward Traditional Culture: Research on the Teaching of Poetry Reciting in Senior Primary Schools [J]. Proceedings of 2021 Science and Education Innovation Symposium of Sichuan Science and Education Maker Association (4th issue), 2021(4).

⁶ Hegel. *Aesthetics* [M]. Translated by Zhu Guangqian. Beijing: The Commercial Press, 1979:282.

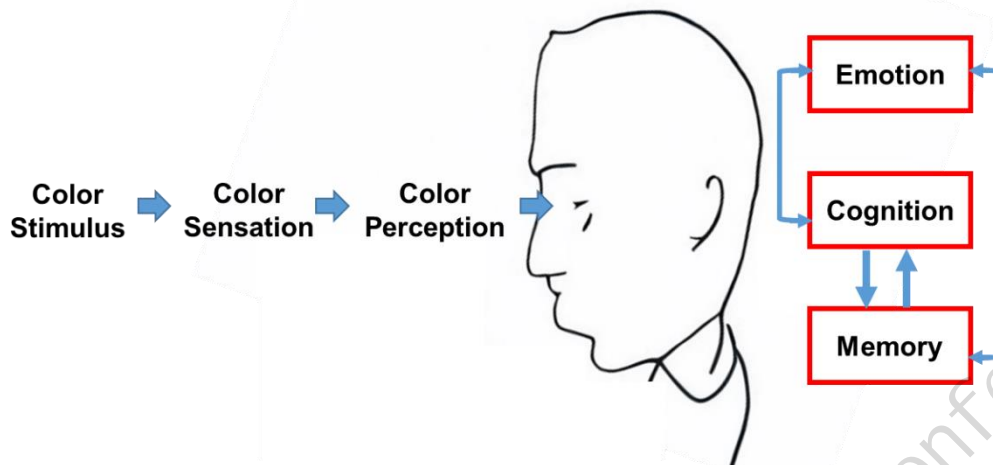


Figure 1. Psychological model of sensation and perception (Toshio Yamanaka, 2003).

Line is a tool employed by poets to convey the dynamic beauty of "image". Russian philosopher and literary critic Belinsky stated that "Poetry cannot tolerate shapeless and bare abstract concepts, which must be embodied in vivid and beautiful images. Thought penetrates images as light penetrates polyhedral crystals." Line, as a basic art symbol, conveys the dynamic beauty of "image" by representing the external form of space. To express emotions through the "image" of a scene, words used to describe the lines play a critical role in the poem. For example, Lin Pu (967-1028) wrote "Dappled shadows hang aslant over clear shallow water," while Wang Wei (693-761) wrote "Lonely smoke straight in the desert, The long river of the yen down." These poems feature elements such as the horizontal reflection of plum blossoms, the straight and upward "Lonely smoke," and the round "setting sun," which illustrate the beauty of lines through their "image." However, the dynamic beauty of these elements is primarily dependent on the reader's imagination. As Huang Yaomian (1903-1987) noted in his essay "Discuss the Beauty of Poetry and the Visualization of Poetry," "When we see the slanting lines in Picture 1, we have the feeling of being in danger, but add a straight line in picture 2, and we have the feeling of stability."

Ultimately, poets employ the use of color to depict the fluctuations of their inner emotions. Regardless of the abstract nature of a poem's theme, the poet must construct an "image" through external objects to effectively convey their message. Natural landscapes provide a wealth of inspiration for poets, and the depiction of color within these landscapes is crucial in describing them. According to Rudolf Arnheim (1904-1994), "It is a undeniable fact that color can express emotion." This capacity stems from the isomorphic correspondence between humans and nature, and color has been demonstrated to elicit both psychological responses, such as association, and physical responses, such as an increased heart rate. Initially, color was simply a representation of objective objects, but through human sensory communication, it has evolved into a deeper expression of abstract emotions, transitioning from the exterior to the interior, and from the tangible to the intangible. Poets possess a strong associative power, storing rich material in their memories and utilizing the colors of these materials to create "images" when composing, thereby allowing them to visually convey the concealed emotions of their hearts.

While art is a two-dimensional form, the images it depicts may appear flat and lacking in emotion. However, through the use of line, composition, and color, the art can evoke a three-dimensional and warm sensation in the viewer. The alteration of lines, composition design, color, and light and shade can stimulate the reader's imagination and transport them to the "image" world of ancient poetry. The scenes portrayed in these poems seem to unfold in the mind, and the characters within them appear to come to life. This sense of spatial beauty, which is guided by vision, highlights the significance of elements such as line, composition, and color in ancient poetry. The arrangement of "images" through line, the connection between "images" through composition, the infusion of temperature and emotion through color, and the imagination of the reader ultimately bring comprehension of the theme of the ancient poem to fruition. Thus, in order to effectively teach "image" in ancient poetry sketches, it is necessary to utilize the means of art, such as line, composition, and color, to stimulate the visual imagination of the reader.

3. Art Teaching Tool “COLOR-IT-UP GAME”

The COLOR-IT-UP GAME itself originated from the creation of poets. It is a new art form created by the English poet Michael Drayton (1563-1631) in 1612. He invented the “COLOR-IT-UP GAME ” for his forthcoming long poem *Poly-Olbion*, which allows the reader to understand the magical creatures he describes living in England and Wales by drawing lines, composing, and filling in colors as he finishes the game. Later, the role of “COLOR-IT-UP GAME “in the field of education has been expanded. It is designed in educational books and various children's books to help different types of readers better digest the knowledge taught in the books. So far, the teaching effect of “COLOR-IT-UP GAME “for learners, especially for children and adolescents, has been generally recognized. With the popularization of computer technology, there are many electronic versions of the COLOR-IT-UP GAME APP in the application market, such as "UNICORN" and so on.

At the same time, many researchers have applied the “COLOR-IT-UP GAME “to the teaching practice. Manuela Pinto (born and died unknown) and Shalom Zuckerman (born and died unknown) wrote in their joint article *Coloring Book: In A new method for testing language comprehension*, Dutch children were asked to fill in color images to prove that “COLOR-IT-UP GAME ” could help children improve their ability to acquire language comprehension.⁷ Jun-Hee Lee (born and died unknown) and Hyeong-Won Jung (born and died unknown), education experts at KwangWoon University, also noted in their article *A Study on The Development Direction for Representation Techniques of Coloring Game Contents for Children's Art* that "through rigorous experiments, they were able to establish that the inpainting activity can enhance children's creativity and imagination."⁸ In conclusion, the role of “COLOR-IT-UP GAME ” in teaching practice has been affirmed by researchers all over the world, and relevant experimental data have been used to support this conclusion.

In addition, some scholars have tried to use “COLOR-IT-UP GAME “to interfere with students' poetry learning, and it has proved to be extremely effective in poetry teaching. 2016 David B. Wandera (born and died unknown) taught a 14-week poetry course centered on the

⁷ Pinto, M. & Zuckerman, S. Coloring Book: A new method for testing language comprehension [J]. *Behavior Research Methods*, 2019(16): 2669-2678.

⁸ Lee, J.H. & Jung, H.W. A Study on the Development Direction for Representation Techniques of Coloring Game Contents for Children's Art [J]. *한국엔터테인먼트산업학회 학술대회 논문집*, 2019:75-82.

study of the poetry of American poet Robert Lee Frost (1874-1963) to 20 students in Nairobi, Kenya. David encouraged students to reflect the poetry content by drawing lines, and composing and filling colors on the whiteboard. Finally, he tested the effect of this art method on the teaching of poetry through oral retell. According to the data presented by David in the article, students learning poetry through "COLOR-IT-UP GAME " are more effective than traditional teaching of poetry in promoting students' "knowledge and understanding of style and content, engagement with thematic tension, and attempts to explain the core aspects of these poems."⁹ Through a series of research methods such as observation and interview of students' behavior, this paper proves that the teaching of poetry by means of art can help students to remember and understand the content and theme of poetry more accurately and quickly, especially the connotation of "image".

In essence, the "COLOR-IT-UP GAME "can quickly convey to students the emotional meaning beyond the poetic text through the means of art. Schwarcz (birth and death are unknown) has defined the influence of art methods on children's understanding of text content in his work *Ways of the illustrator: visual communication in children's literature*: "They use these elements to express meaning through pictures and constitute visual language or visual communication."¹⁰ As these visual elements are superimposed, textual meaning also becomes increasingly clear in children's brains. In other words, the text "image" and pictures are interdependent. Text without art images is ambiguous, incomplete, and unable to convey important visual information. Similarly, art elements without text are too abstract and lack focus. In fact, from the perspective of human history and evolution, images and words belong to the same symbol system. Images can be traced back to Paleolithic cave paintings,¹¹ which were created to record and convey information. This image symbol was the first written language of human beings, which was gradually abstracted and eventually evolved into written language.¹² The process of the image to text makes researchers start to think that our teaching of ancient poetry should not be limited to the text level, and image teaching through art also needs to be considered.

Therefore, "COLOR-IT-UP GAME " is a suitable art tool for teaching sketching ancient poems. In the process of completing the game, students restore the "image" image in their hearts through lines, composition, and color filling, and finally achieve the purpose of understanding the theme and emotion of ancient poems. At the same time, many experts have studied this topic and obtained positive conclusions. As the German psychologist Rudolf Arnheim (1904-2007) elaborated in his *new essays on the psychology of art*, "the mind needs the image, and the image contains the thought."¹³ Vision is far ahead of text language at the level of thinking, "The real effective thinking in any cognitive field occurs first in the image field."¹⁴ In the teaching of "image" in sketching ancient poems, we use the means of art to

⁹ Wandera, D. B. Teaching Poetry Through Collaborative Art: An Analysis of Multimodal Ensembles for Transformative Learning [J]. *Journal of transformative education*. 2016(4): 305–326.

¹⁰ Schwarcz, J. H. *Ways of the illustrator: visual communication in children's literature* [M]. Chicago: American Library Association, 1982.

¹¹ Matthew Biro. *Phaidon Focus: Anselm Kiefer*[M]. Translated by Zhang Fan. Guangxi: Guangxi Fine Arts Publishing House, 2014.

¹² Schmandt-Besserat, D. The evolution of writing [J]. *International Encyclopedia of Social and Behavioral Sciences*, 2014:1-15.

¹³ Arnheim, R. The images of pictures and words [J]. *Word & Image*, 1986(4): 306-310.

¹⁴ Martínez Ortega, R.M. & Tuya Pendás, L.C. & Martínez Ortega, M. & Pérez Abreu, A. & Cánovas, A.M.

depict "image" images, which is to use vision to convey ideas and stimulate students' thinking and resonance with visual beauty.

4. Conclusion

In conclusion, today's society places a significant emphasis on visual input and the utilization of visual teaching within the education system. While the electronic network has created a visual platform for the dissemination of information, news, and instructions, the role of visual teaching in the classroom has yet to receive adequate recognition. The public and teachers alike have underestimated the capacity of students to comprehend informative meaning from visual images, which is crucial in their learning process. The Dell Experience Cone model highlights the importance of visual symbols in the learning process, as students are capable of absorbing meaning from visual images prior to linguistic symbols. This is a fundamental aspect of their development, as it enables them to effectively participate in the complex world. Aristotle's statement, "Without images, thinking is impossible," underscores the significance of visual teaching in education. This paper aims to provide an innovative solution for teaching the "image" of sketching ancient poems by incorporating the "COLOR-IT-UP GAME" teaching method, which utilizes art and visual elements. This is not only a creative teaching method for Chinese educators, but also a valuable practical training for students to prepare for the future visual information society.

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Research Hotspots and Trends of IT-based Foreign Language Teaching in China

– Based on CiteSpace Knowledge Map

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Abstract:

With information technology being widely applied in the field of education, IT-based foreign language teaching has gradually become a tendency. IT-based foreign language teaching refers to the use of Information Technology (IT) tools, such as computers, internet, and mobile devices, to facilitate and enhance the teaching and learning of foreign languages, whose teaching modes and effects also attract more and more teachers and educators to study. To get the hot spots and trends of IT-based foreign language teaching in China, the paper searched articles retrieved in CNKI from 2003-2023, in which 308 articles were collected for “IT-based foreign language teaching” or “informatization of foreign language teaching” as the research object with CiteSpace used for knowledge mapping and a quantitative analysis. Based on analyzing annual publication distribution, authors, institutions, and keywords, the study shows that: 1) the research hotspot of IT-based foreign language teaching in China has changed from simplification to diversification, showing a significant growth trend; 2) the domestic research has gone through four stages: the initiation (2003-2004), the rising period (2005-2009), the outbreak period (2010-2017) and the stable period (2018-present); 3) in China IT-based foreign language teaching is likely to be more innovative, learner-centered, and personalized approaches to language instruction using technology, in order to address the diverse needs and preferences of learners in different contexts or the applications of information technology, while fewer researchers focus on its theoretical study. With the knowledge map and visual analysis, the paper provides a reference for the in-depth study of IT-based foreign language teaching, prospecting the future development trend.

Keywords: IT-based Foreign Language Teaching, CiteSpace, Knowledge map

0 Introduction

With the information age coming, the application of information technology in the field of education has become more common. Compared with the traditional teaching mode, Chen Jianlin et al. believe that information teaching is a new type of teaching form^[1], which will not depart from the relevant teaching theory, still under the constructed teaching framework. At present, education informatization has gradually formed a degree of deep integration of disciplines and information technology, and “big data, artificial intelligence, smart education, etc. will make the development of education informatization become inevitable for the development of the times”.^[2] To accelerate the modernization of education and the construction of a strong country in education, in April 2018, China’s Ministry of Education issued the “Education Informatization 2.0 Action Plan”, which clarifies that “the Action Plan is a specific implementation plan to promote ‘Internet + education’”, and it is also an effective way to accelerate the realization of education modernization^[3] Action Plan.

Information education is an important symbol of educational modernization, and foreign language teaching is an important way to cultivate foreign language talents in the new era. In recent years, with the rapid development and popularization of information technology, the application of information technology in foreign language teaching has become more and more extensive, and the emerging teaching mode of information-based foreign language teaching has gradually formed, and foreign language teaching based on information technology has become the main practical method of foreign language teaching in colleges and universities^[4]. Information-based foreign language teaching organically combines modern education technology

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with foreign language teaching, which not only improves the efficiency and quality of students' learning of foreign languages, but also improves the professional quality of teachers to a certain extent. However, the application of informatized foreign language teaching mode in China is still in the exploratory stage, and many studies are not in-depth enough, so this study aims to sort out and analyze the development status and hot spots of domestic informatized foreign language teaching research, and to provide reference for the future development of informatized foreign language teaching in China.

1 Data Sources and Analysis Methods

1.1 Data Sources

CNKI is a comprehensive academic paper retrieval and download website, mainly providing academic resources and services such as literature retrieval, references, academic papers, and research reports. In the academic community, CNKI has extensive influence and popularity in academic research and achievement dissemination. As the largest academic paper database in China, CNKI is a high-quality, all-round and multidisciplinary academic paper database, with a large number of literature resources and high-quality academic papers, which can provide important academic research and achievement dissemination channels for the academic community.

This paper uses CNKI database as the source of research literature, and the search period is from January 2003 to June 2023, with the theme of "informatization of foreign language teaching" or "IT-based foreign language teaching". A total of 517 articles including newspapers, dissertations, academic journals and other related literature were retrieved. In order to ensure the objectivity and accuracy, 334 academic journal papers were obtained by setting the Chinese journals as the search scope, and a total of 308 valid journal papers were obtained after careful manual screening and removal of irrelevant literature such as book reviews, notices, and advertisements, with the search time being June 10, 2023.

1.2 Analysis Methods

CiteSpace was first used in 2016 when it counted and analyzed authors and publications in the global medical literature, as well as collaborations between researchers. Over time, CiteSpace has expanded its range of applications, not only as a powerful scientific data analysis software, but also as a visualization tool based on the idea of scientific knowledge maps, which can display scientific knowledge graphs in an intuitive and visual way, and which can help researchers better understand and analyze key concepts, themes and trends in their research field. As a technology data analysis software, CiteSpace is currently widely used around the world. With CiteSpace 6.2.R4, this paper draws a knowledge map of the journal papers of informatized foreign language teaching, analyzes the map with the help of quantitative data, and the characteristics, hot spots and trends of China's informatized foreign language teaching and research by using relevant information such as annual publication volume, scientific research cooperation network, distribution of scientific research institutions and keywords.

2 The Dynamic Research Analysis in China based on CiteSpace

2.1 The Quantity Analysis of Published Articles

In bibliometrics, the number of publications is an important indicator to measure the development trend of a certain research field in a specific period of time, so that the research dynamics or changes of hot spots in this field can be more accurately reflected from the quantitative perspective; it is of great significance to predict the future research development trend of this field^[5]. The higher the number of published literature, the more the attention and research activity in this field, which can also reflect the research trend in this field. Through the statistics of the number of papers published in Chinese informatized foreign language teaching journals included in CNKI, and a linear fit made by Excel software, the cumulative number of publications and fitting curves of domestic informatized foreign language teaching papers were obtained (Figure 1). It can be seen from the curve that from 2003 to 2023, the number of published articles has been showing a rising trend, indicating that scholars and teachers have gradually paid attention to IT-based foreign language teaching research in the past two decades. The analysis shows that the development of domestic informatized foreign language teaching research can be divided into four stages: the initial period (2003-2004), the rising period (2005-2009), the outbreak period (2010-2017) and the stable period (2018-present).

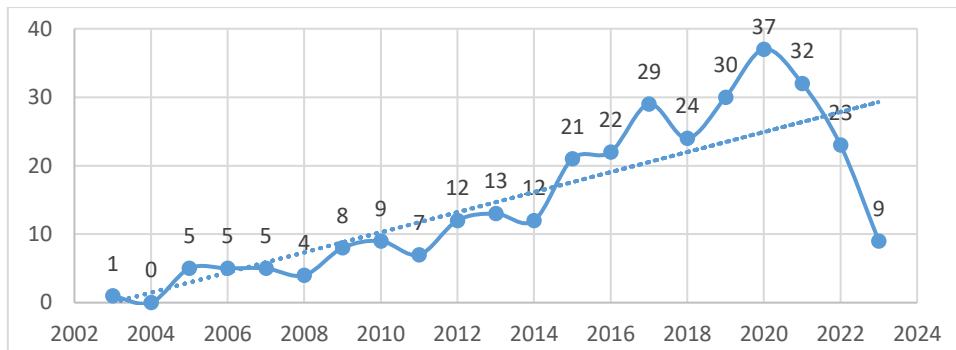


Fig. 1 The Linear Fit of IT-Based Foreign Language Teaching Articles Annually Published

From 2003 to 2004, the initial period, only 1 article was published in 2003 and 0 in 2004, during which information technology developed relatively slowly and the application of IT-based foreign language teaching was seriously limited. On December 5, 2004, the Ministry of Education issued the notice of “Technical Competency Standards for Primary and Secondary School Teachers (Trial)”^[6], which is the first professional competency standard for primary and secondary school teachers promulgated in China, and puts forward specific provisions on teacher awareness and attitude, knowledge and skills, application and innovation, and social responsibility in applying educational technology. The implementation of this standard aims to improve the application level of educational technology among primary and secondary school teachers and to promote the professional development of teachers.

From 2005 to 2009, the rising period of information-based foreign language teaching and research showed an active trend, and there were great developments and breakthroughs in technology and teaching mode. With the further popularization and development of the Internet and computer technology, information-based foreign language teaching has ushered in new opportunities during this period. The improvement of network, the maturity of multimedia technology and the popularity of mobile devices have provided more technical support and application scenarios for foreign language teaching, making foreign language teaching more interactive and personalized to push the study into the outbreak period from 2010 to 2017. In particular, in June 2016, the Ministry of Education promulgated the 13th Five-Year Plan for the Development of Education Informatization, which clarifies the overall goals and key tasks of the development of education informatization, including promoting Internet + education, building digital learning resources, and improving the ability to apply information technology^[7]. The continuous development and popularization of information technology in 2018 has provided more innovative means and resources for foreign language teaching, making teaching more flexible and personalized.

From the article “My Views on the Informatization Reform of Foreign Language Teaching” in 2003, it began “to discuss the necessity, feasibility and theoretical basis of the informatization reform of foreign language teaching in the 21st century”^[8], and the research of informatized foreign language teaching has gradually paid attention to the integration of technology and teaching, increasing the research of teachers’ informatization teaching ability and information literacy. Since 2018, such subjects as the individual differences of students, students’ independent learning and cooperative learning ability, and information literacy in foreign language teaching have been widely accepted by teachers, students, schools and society, pushing the IT-based foreign language teaching into its stable period.

2.2 The Analysis of Research Institutions

The analysis of research institutions publishing articles in a particular field can help to understand the research community or major research forces in that field. Xu Zhenyu et al.^[9] pointed out that analyzing the main research institutions, core authors and publication volume in a certain field can help to achieve a clearer and more specific understanding of the research status and research situation or strength in this field. This paper uses CiteSpace software to process the selected document sample data, set the node type to “institution”, and the rest of the settings are system defaults.

For the teaching and research of domestic and foreign language informatization, it can be seen that the statistical analysis of institutions with more than or equal to 3 articles in the Chinese sample is used by CiteSpace software (as shown in Fig. 2). The research institution with the largest number of published articles is Shanghai International Studies University (12 articles),

followed by Beijing Foreign Studies University (6 articles), Wuxi City College of Vocational Technology (4 articles), Dalian University of Foreign languages (4 articles), Southeast University (4 articles) and Liaoning Vocational College of Light Industry (4 articles). From the perspective of the organization as a whole, Information-based foreign language teaching and research institutions are usually gathered in universities or research-oriented institutions, because these institutions have richer research resources and professional talents, such as 5 related papers published by the China Foreign Language Strategic Research Center among the 12 papers published by Shanghai International Studies University. From their geographical locations, whether it is Shanghai International Studies University or Beijing Foreign Studies University, they form the polarized regional characteristics of “one south and one north”, while other research institutions with more publications tend to be concentrated in developed areas, mainly because these regions have better infrastructure, network environment, scientific research conditions and financial support, reflecting strong regional differences.

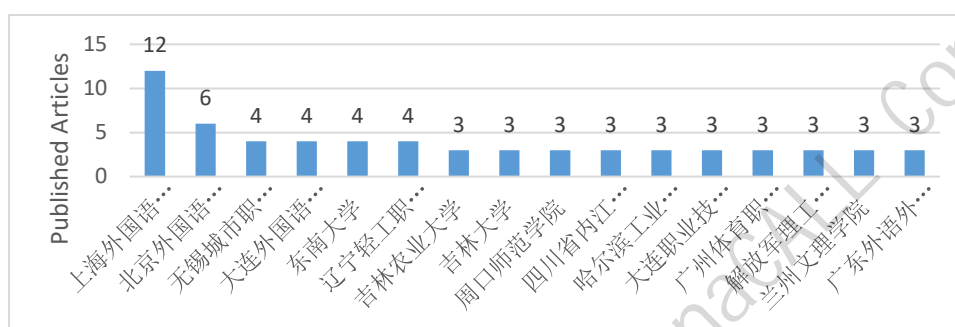


Fig. 2 Main Research Institutions of IT-Based Foreign Language Teaching in China

From the institutional types, foreign language informatization teaching and research institutions are mainly concentrated in foreign language universities and vocational colleges. With the rapid development and application of information technology, it has become the trend of the times. Vocational colleges train students who are usually oriented to employment in specific industries and have a high demand for IT-based foreign language teaching. Therefore, strengthening research foreign language informatization teaching can better meet the industry’s requirements for talents. It can be seen from the institutional cooperation map that there are 297 nodes of research institutions in the literature sample, only 47 cooperation connections between institutions, and the density of institutional cooperation network is only 0.0011, which shows that the institutional cooperation of domestic informatized foreign language teaching and research is relatively weak, and the cooperation between scientific research institutions needs to be strengthened.

2.3 The Analysis of Authors

Through the analysis of selected literature, it can be counted that Chen Jianlin of Shanghai International Studies University (as shown in Table 1) published 8 articles, and as early as 2009, Chen Jianlin began to study the foreign language teaching mode in the data-driven information environment^[10], and then researched the current situation of foreign language teaching in the information age, reconstructed the teaching paradigm and explored the development trend of information-based foreign language teaching, and with the development of artificial intelligence, the embodiment and application of artificial intelligence technology in foreign language teaching were discussed^[11]. Among the high-yield authors, Deng Yanlin focuses on the reform of informatized foreign language teaching in vocational colleges under the background of “Internet + education”^[12], while Yao Xiaojun on the direction and approach of informatization practice of foreign language teaching in vocational colleges in the network environment^[13].

According to the calculation formula of Price’s law: $M = 0.749\sqrt{N_{max}}$ (N_{max} refers to the largest number of published articles), the threshold of high-prolific authors in IT-based foreign language teaching literature is calculated to be 2.12, so authors with more than or equal to 3 in this study are called high-yield authors. Statistics found that the total number of publications of high-prolific authors in domestic informatized foreign language teaching literature is 18, accounting for 5.84%, far lower than the total proportion of core authors publishing 50% of the total number of publications, and this data can clearly show that the scientific research cooperation between authors is relatively weak, and the number of publications is fewer, although a small

number of core authors or research teams have been formed, but a group of high-yield or influential core authors and research teams have not yet been formed.

Table 1 The High-yield Authors of Foreign Language Informatization Teaching (Top 10)

Articles	Year	Author	Articles	Year	Author
8	2009	陈坚林	2	2021	张莲
4	2019	胥春兰	2	2017	王京华
3	2019	邓燕林	2	2017	方秀才
3	2015	姚小菊	2	2009	史光孝
2	2016	李霄翔	2	2017	韩红梅

3. The Analysis of Hot Spots and Trends

Research hotspots are common research themes reflected the concerns of most researchers or scholars engaged in research in this field or related fields during a certain period, which can judge the future research direction. After 308 documents being loaded into CiteSpace, Keyword is selected from the network node, the time slice is 1 year, and the hot issues and research trends in the field of domestic informatization foreign language teaching research can be obtained through the co-occurrence, clustering and burstness analysis of keywords.

Fig. 3 The Co-occurrence Knowledge Map of Foreign Language Informatization Teaching in China



3.1 The Co-occurrence Analysis of Key Words

As a kind of vocabulary that represents the topic of the literature, keywords can generally describe the theme and core content of the literature, that is, by analyzing the keywords, the core connotation of the literature and the research focus can be obtained. Based on this, as a keyword that summarizes the topic, the number of occurrences in the literature is called word frequency or frequency, and the more it appears in the literature, the greater the frequency, which can reflect the research connotation, hot spots and evolution trends in this field. This paper uses the keyword word frequency analysis function of CiteSpace 6.2.R4 software to get 249 network nodes and 424 network links. The network density of 0.0137 informatized foreign language teaching keywords co-appeared in the network map (Figure 3), indicating that the degree of keyword connection is relatively loose and not close enough, especially without too much focus on theoretical research. In terms of English teaching and higher vocational English, research on other foreign languages is relatively weak, which is determined by the status of English as an international language. With the development of informatization, globalization and integration, it is possible that the foreign language informatization teaching and research of other languages will be integrated into China's education system, but it will take a long time.

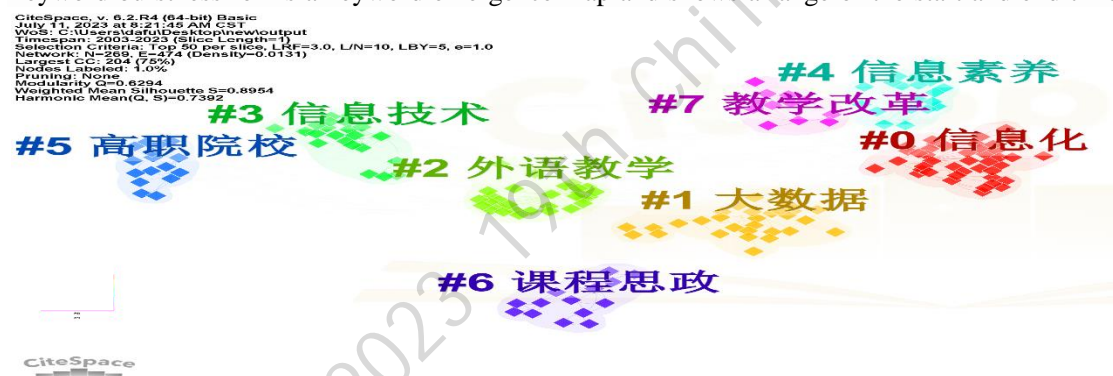
3.2 The Clustering Analysis of Key Words

To further understand whether there is a common relationship between studies in this field, “keyword” is selected as the node type in CiteSpace, and the “LLR” (log-likelihood ratio) algorithm is selected to run the software while keeping other parameters unchanged, forming Figure 4, and obtaining 269 nodes, 474 connections and 51 clusters. Among them, the clustering module value (Modularity) of the keyword clustering map is 0.6294, generally greater than 0.3, which means that the cluster structure is significant; the average contour value of the keyword clustering map (Mean Silhouette) is 0.8954, while the general average value is greater than 0.5 clustering is reasonable, and greater than 0.7 means that the cluster is credible. By analyzing the keyword clustering map, the top eight clustering themes are: #0 信息化, #1 大数据, #2 外语教学, #3 信息技术, #4 信息素养, #5 高职院校, #6 课程思政 and #7 教学改革. It shows that the domestic IT-based foreign language teaching and research is mainly based on informatization, information technology and other means, and it also keeps pace with the times, that is, the emergence of informatization teaching methods such as big data. In the process of steadily promoting informatization teaching, foreign language informatization teaching should carry out practical exploration, serving to cultivate morality among students, that is, constantly strengthening curriculum ideology and politics, through improving information literacy and foreign language teaching reform. Such a teaching way gives play to the revolutionary role of information technology in education and achieves the goal of cultivating talents who adapt to the times and social development.

Fig. 4 The Keyword Clustering Knowledge Map of IT-based Foreign Language Teaching in China

3.3 The Burstness Analysis of Key Words

In view of the obvious change of keyword citation frequency over a period of time, the keyword burstness forms a keyword emergence map and shows a range of the start and end time



of burst keywords. The research topics or widely concerned hot spots can be detected in the research field at that time, and the changes and dynamics of the research topics can also be reflected in the field. Figure 5 is the top 10 keywords with the strongest citation bursts from 2002 to 2023, and due to space limitations, this paper only lists the top three keywords of sudden intensity: the largest emergent intensity is information literacy (2.96), followed by online teaching (2.71) and multimedia (2.35). However, before 2006, there was no obvious burst keyword, indicating that the reform of IT-based foreign language teaching and research is still in the exploratory stage, and due to subjective and objective reasons such as technology, network, and acceptance, information-based foreign language teaching and research has not been fully carried out.

Top 10 Keywords with the Strongest Citation Bursts

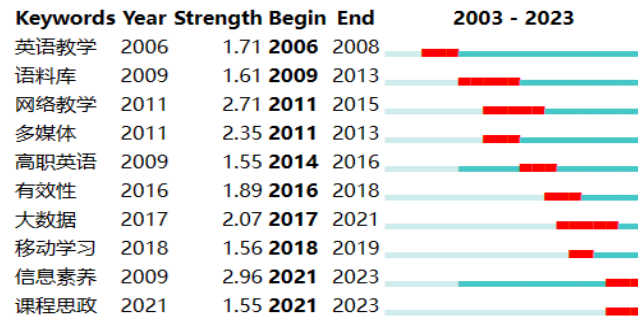


Fig. 5 The Keyword Burst Knowledge Map of IT-based Foreign Language Teaching in China

As teaching methods and methods, “online teaching” and “multimedia” have always been used in foreign language teaching, but the widespread attention appeared in 2011. This situation is due to the fact that in 2010, China successively issued “Outline of the National Medium- and Long-term Education Reform and Development Plan” and “National Medium- and Long-term Talent Development Program”, both of which pointed out the following strategic goals: “By 2020, the modernization of education will be basically realized, forming a learning society, and entering the ranks of human resource powers”, which represents a new stage in China’s education development and talent development. The main way to realize the modernization of education is online teaching and multimedia, which are fully applied and reflected in IT-based foreign language teaching. Through video conferencing, online discussions, and distance learning, students can collaborate and interact with teachers and students in different spaces in real time, across the constraints of time and space. Online education and multimedia provide students with more learning opportunities, promote students’ interest in learning, and improve the effectiveness of foreign language teaching. In 2009 “information literacy” first appeared in the literature, and then a large number of literature or researchers paid attention to the importance, necessity and urgency of improving information literacy. The reason for this sudden burst can be traced back to the European Union’s first “Action Plan for Digital Education (2018)” issued in 2018, which emphasized information literacy as an important component of digital literacy, called for strengthening students’ understanding of information and media, and cultivating their ability to judge, evaluate and use digital information to meet the requirements of modern society for information processing and utilization. In general, the burst nature of the above keywords is often caused by specific events, policies or scientific and technological developments, and promotes research and development in this field by arousing public interest and attention.

4. Conclusion

With the rapid development of new technologies such as big data and artificial intelligence, the IT-based teaching mode has become a hot spot in foreign language teaching and research, which plays a great role in realizing “modernization, informatization, intelligence and diversification” [14] of foreign language teaching. This paper uses CiteSpace software to visually analyze the research of foreign language informatization teaching in China by drawing knowledge maps. After analyzing the relevant articles published, this paper gets the current research hotspots and future trends of IT-based foreign language teaching in China, which mainly focus on the following aspects: 1) online teaching or multimedia teaching mode is studied based on modern educational technology means, big data or artificial intelligence; 2) more attention is paid to the classroom teaching mode and foreign language online teaching in the IT-based teaching environment; 3) in the context of educational modernization, the information literacy, learners’ learning interests and strategies of teachers and students will still be the research focus. After sorting out the research status in this field, the research on informatized foreign language teaching will continue to deepen, not only focusing on digital teaching resources, online learning, the integration of new media technology and foreign language teaching, but also further exploring from the aspects of information literacy, teaching mode and practice, in order to promote the development of IT-based foreign language teaching and research.

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A Study on the Correlation between Chinese University Students' Online Learning Self-Efficacy and English Autonomous Learning Ability in Network Environment

Abstract: This paper adopted a questionnaire survey to investigate the relationship between 105 university students' online learning self-efficacy and English autonomous learning ability, and the data was analyzed by SPSS27.0 to find that: first, university students' English autonomous learning ability is generally at a moderately high level; second, university students' online learning self-efficacy is at a moderately high level; third, the self-efficacy of online learning and the ability to learn English independently are highly positively correlated.

Keywords: Chinese university students; online learning self-efficacy; English autonomous learning ability

1. Introduction

With the development of information and communication technology development, e-Learning is emerging as the paradigm of modern education. The great advantages of e-Learning include liberating interactions between learners and instructors, or learners and learners, from limitations of time and space through the asynchronous and synchronous learning network model (Katz, 2000; Katz, 2002; Trentin, 1997). E-learning fulfills the requirements for learning in a modern society and have created great demand for e-Learning from businesses and institutes of higher education. Intelligent technologies such as visualization of the Internet promote the continuous improvement of university students' online learning self-efficacy, continuously improve their autonomous learning ability, promote their formation of scientific thinking, and comprehensively improve their comprehensive literacy.

2. Literature Review

American psychologist Bandura (1981; 1977) believed that self-efficacy refers to an individual's judgment of his or her ability to perform a behavior effectively, and is

a concrete expression of an individual's ability and self-confidence in a certain activity. Computer self-efficacy is a specific manifestation of self-efficacy in the computer domain, which refers to an individual's judgment of his or her ability to use computers (Compeau & Higgins, 1995; Compeau & Higgins, 1999). With the rapid development of Internet technology, the study of students' Internet self-efficacy came into being, and Torkzadeh & Van Dyke (2001), Torkzadeh & Van Dyke, (2002) define it as a perceptual judgment of individuals' ability to use the Internet. Based on this, Xie Youru et al. (2011) proposed that online learning self-efficacy is an individual's belief that he or she can succeed in online learning activities which includes four aspects: "sense of competence, sense of effort, sense of environment, and individual's sense of control over behavior". Based on these definitions, this paper defines online learning self-efficacy as a self-evaluation of one's ability to use the Internet in the learning process, which is consisted of sense of competence, sense of effort, sense of environment, and sense of control (Xie Youru et al., 2011)

The concept of autonomous learning was introduced to the field of language teaching by Holec (1979, p.3), who defined autonomous learning as "the ability to take charge of one's own learning". Later, Nunan (1995) developed the idea and considers learners who are able to set their own goals and create learning opportunities to be autonomous learners, and Littlewood (1999) considers autonomous learning as learners applying what they have learned without relying on the teacher. Unlike Holec (1981), Nunan (1995), and Littlewood (1999) who define autonomous learning as a competency, other scholars define it as a performance or activity (Pang, 2001), a potentially self-directed learning behavior (Benson & Voller, 2014). Therefore, Gardner & Miller (1999) later define an autonomous language learner as a person who begins to plan and implement his learning project. Then, Xu

Jinfen (2020) classifies English autonomous learning skills into four areas of competence: self-planning competencies, self-exploration of effective learning strategies, self-emotional management competencies and multiple interactive learning competencies. Based on the above discussions, this paper defines the English autonomous learning as the activity or multidimensional ability of individuals to take charge of the learners' own English learning, which is consisted of understanding teaching objectives and requirements, setting learning goals and learning plans, using learning strategies, monitoring learning strategies and monitoring the English learning process (Xu, 2007).

There are many studies on the online learning self-efficacy, the autonomous learning ability and the correlation between self-efficacy and autonomous learning ability.

First, scholars have done research on online learning self-efficacy, and found that online self-efficacy has an impact on online learning (Joo, Bong & Choi, 2000; Song et al, 2004; Tong & Bian, 2005; Yin & Xie, 2010). Song et al. (2004) proposed that online self-efficacy is an assessment of the learner's self-efficacy to organize and perform Internet-related activities that will produce desired outcomes for online learning. What's more, Joo, Bong and Choi (2000) found that self-efficacy is an important factor in determining the effectiveness of online learning. Secondly, domestic and international scholars have also done a lot of research on autonomous learning ability. The main focus has been on the study of the definition of autonomous learning ability (Holec, 1979; Littlewood, 1999; Nunan, 1995; Benson & Voller, 2014; Gardner & Miller, 1999; Pang, 2001; Xu, 2020), the study of the factors influencing autonomous learning ability (Bandura, 1977; Littlewood, 1999) and the study of the cultivation of autonomous learning ability (Xu, 2020). Then, there are also a large

number of studies on the correlation between self-efficacy and autonomous learning ability. Most studies have demonstrated that self-efficacy is positively related to autonomous learning ability (Pintrich & De Groot, 1990; Schunk, 1990; Zimmerman, 1990; Zimmerman & Bandura, 1994; Bandura et al. 2003; Li, 2016). Self-efficacy and learning motivation (Zimmerman, 2000), goal setting (Mone, Baker & Jeffries, 1995; Zimmerman, Bandura & Martinez-Pons, 1992; Elliot & Church 1997), and the use of learning strategies (Zimmerman & Martinez-Pons, 1990; Bandura, 1997), self-monitoring and self-evaluation (Bouffard-Bouchard, Parent & Larivee, 1991) have a positive relationship as well. Self-efficacy is one of the most important intrinsic factors influencing learners' autonomous learning (Schunk, 1990).

In summary, the existing studies have mainly focused on the study of online learning self-efficacy (Joo, Bong & Choi, 2000; Song et al, 2004; Tong & Bian, 2005; Yin & Xie, 2010), the study of autonomous learning ability (Bandura, 1977; Holec, 1981; Littlewood, 1999; Nunan, 1995; Benson & Voller, 1997; Gardner & Miller, 1999; Pang, 2001; Xu, 2020) and the study of the correlation between self-efficacy and autonomous learning ability (Pintrich & De Groot, 1990; Schunk, 1990; Zimmerman, 1990; Zimmerman & Bandura, 1994; Bandura et al. 2003; Li, 2016)., but there are fewer studies on the correlation between online learning self-efficacy and English autonomous learning ability in the network environment. Therefore, this study will explore the correlation between English autonomous learning ability and online learning self-efficacy in the networked environment based on triadic interaction determinism and humanistic learning theory.

3. Research Design and Process

3.1 Research questions

This study mainly explores the following questions.

1. What is the current situation of Chinese university students' online learning self-efficacy?

2. What is the current situation of Chinese university students' online English learning autonomous learning ability?

3. What is the correlation between Chinese university students' online learning self-efficacy and their English learning autonomous ability?

4. Which dimensions of English autonomous learning ability have good predictive validity for online learning self-efficacy?

3.2 Research Subjects

The subjects of the study are 105 university students from different universities in different majors and different grades. A random sampling was conducted through an Internet survey, and a total of 110 questionnaires were distributed in this study. 5 invalid questionnaires were excluded to get 105 valid questionnaires, with a rate of valid return of over 95%.

3.3 Research Tools

The English Autonomous Learning Ability Questionnaire developed by Xu Jinfen (2007) and the Internet Self-Efficacy Questionnaire developed by Xie Youru et al. (2011) were used in this study. Both sets of questionnaires use a 5-point Likert scale, which is divided into "strongly disagree," "disagree," "neutral," "agree," and "strongly agree."

This study will adopt two questionnaires: The Online Self-Efficacy Questionnaire by Xie Youru et al. (2011) and English Autonomous Learning Ability Questionnaire by Xu Jinfen (2007). The Online Self-Efficacy Questionnaire includes "sense of competence" (1, 5, 10, 13, 19 questions), "sense of effort" (3, 6, 8, 9, 18 questions), "sense of environment" (11, 12, 15, 16, 17 questions), and "sense of

control” (2, 4, 7, 14, 20 questions), with a total of 20 items. The Cronbach's alpha coefficients of the four dimensions of the Online Learning Self-Efficacy Scale are 0.917, 0.929, 0.945, and 0.827, respectively, and the Cronbach's alpha coefficient of the Online Learning Self-Efficacy Scale is 0.945, which were all higher than 0.8, indicating that the reliability of the scale was high.

The English Autonomous Learning Ability Questionnaire includes “understanding teaching objectives and requirements” (1-5 questions), “setting learning goals and learning plans” (6-10 questions), “using learning strategies” (11-15 questions), “monitoring learning strategies” (16-22 questions) and “monitoring the English learning process” (23-32 questions), with a total of 32 items in five dimensions. The Cronbach's alpha coefficients of the five dimensions of the English autonomous learning ability scale are 0.926, 0.904, 0.895, 0.882, and 0.888, respectively, and the Cronbach's alpha coefficient of the English autonomous learning ability scale is 0.918, which were all higher than 0.8, indicating that the reliability of the scale was high. After that, the data were analyzed using SPSS27.0, a statistical software for social sciences.

4. Research Results and Discussion

4.1 The general situation of university students' online learning self-efficacy

Table 1 Descriptive statistics of the overall level and four dimensions of online learning self-efficacy

	N	Minimum	Maximum	Mean	Std. Deviation
Online learning self-efficacy	105	2.30	5.00	3.60	.62
Sense of competence	105	2.40	5.00	3.67	.58
Sense of effort	105	2.00	5.00	3.61	.69
sense of environment	105	1.80	5.00	3.55	.70
Sense of control	105	1.80	5.00	3.55	.69
Valid N (listwise)	105				

From the descriptive statistics of the overall level and four dimensions of online learning self-efficacy in Table 1, we can see that the mean values of “sense of competence,” “sense of effort,” “sense of environment,” and “sense of control” are all higher than 3. Therefore, the overall self-efficacy of online learning of university students is at a moderately high level. The standard deviation of university students’ learning online learning efficacy is 0.62, which indicates that there are significant differences in the level of university students’ online learning self-efficacy. Among them, the highest score of self-competence (3.67±0.58) indicates that university students are more confident in their sense of self-competence. The lowest scores for sense of environmental control and sense of behavioral control indicate that university students lack confidence in sense of environmental control and sense of behavioral control.

The above data indicate that: firstly, students in the information age can make good use of the Internet for learning, so their online learning self-efficacy is at a moderately high level; secondly, due to individual differences, there are differences in the level of online learning self-efficacy; finally, in terms of “sense of competence”, university students are more confident in their expectation of the results of online learning, and in their ability to achieve the goal of online learning. However, in terms of “sense of environment”, university students cannot actively and effectively use the online learning environment for learning. In terms of “sense of control,” university

students cannot control their online learning activities and learning behaviors well, and are easily disturbed by the outside world.

There may be several reasons for such a result. First, with the development of multimedia technology and network technology, online learning has become one of the main ways of learning for learners, and students are gradually adapting to online learning, so their online learning self-efficacy is at a moderate to high level; due to the differences in learners' understanding of his systematic position in online learning, his psychological position, and his understanding of the strategies and activities necessary to obtain the required information is increased. Therefore, the level of self-efficacy in e-learning varies, which is consistent with the findings of Marchionini (1988).

Second, the lack of confidence in the sense of “environment” and “sense of control” can be explained from two perspectives. The first perspective is that the level of network orientation can affect the learners' perception of their position in the network system, the purpose of the voyage, the way to return to their original position in the system and to protect them from the contamination of information to secure their psychological position (Marchionini, 1988). The second perspective is that the vast amount of information resources can also increase the blindness of students' learning, their cognitive load, misconceptions, and other “superego knowledge zones” in the learning process. At the same time, although hypertext and hypermedia technologies are used extensively in e-learning systems, the information lacks a properly organized hypertext and hypermedia information system, which may lead to a sense of loss and disorientation of learners and ultimately affect the quality of e-learning (Hu, 2002).

4.2 The overall situation of university students' English autonomous learning ability

Table 2 Descriptive statistics of the overall level and of five dimensions of English autonomous learning ability

	N	Minimum	Maximum	Mean	Std. Deviation
English autonomous learning ability	105	2.04	5.00	3.57	.56
Understanding teaching objectives and requirements	105	2.00	5.00	3.62	.58
Setting learning goals and learning plans	105	1.60	5.00	3.63	.69
Using learning strategies	105	1.60	5.00	3.48	.66
Monitoring learning strategies	105	2.00	5.00	3.61	.62
Monitoring English learning process	105	1.80	5.00	3.53	.67
Valid N (listwise)	105				

From the descriptive statistics of the overall level and of five dimensions of English autonomous learning ability in Table 2, we can see that the English autonomous learning ability in the five dimensions (understanding teaching objectives and requirements, “setting learning goals and learning plans”, “using learning strategies”, “monitoring learning strategies”, and “monitoring English learning process”). Their mean values are all higher than 3, which means that university students’ English autonomous learning ability is at a moderately high level. The standard deviation of university students’ English autonomous learning ability is 0.56, which indicates that there is a significant difference in the level of university students’ English autonomous learning ability. The highest score (3.63 ± 0.69) was for setting learning goals and learning plans, indicating that the university students are able to make reasonable learning plans and goals. The lowest score was for using learning strategies (3.48 ± 0.66), indicating that university students are less capable of using appropriate learning strategies.

The above data indicate that, firstly, university students have better self-control and autonomy, so their English autonomous learning ability is at a moderately high

level; secondly, due to individual varieties, there are differences in the level of university students' English autonomous learning ability; finally, university students are generally able to make reasonable learning plans and goals but choose a single learning strategy.

The reason for this may be as follows. First of all, since autonomous learning is a learning process with initiative and constructive nature carried out by learners, university students, after years of training in learning methods and strategies, have already had better self-control and autonomous learning ability, so they could have better English autonomous learning ability. Second, due to the professional need for education, university students generally have a very clear learning purpose, and are therefore able to make reasonable learning plans and goals. Third, due to the lack of teachers' guidance, university students choose learning strategies that are more homogeneous and simplistic. However, the effective use of learning strategies can improve learning autonomy and self-direction, and also benefit lifelong learning. Therefore, teachers' in-depth understanding of learning strategies and enhanced training of learning strategies in classroom teaching will have a positive impact on learners' self-directed learning ability and lifelong learning (Xu, 2007).

4.3 Correlation between online learning self-efficacy and English autonomous learning ability

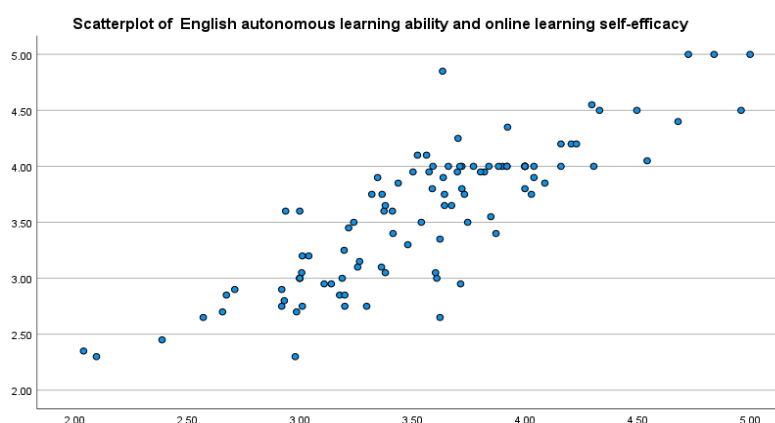


Figure 1 Scatter plot of English autonomous learning ability and online learning self-efficacy

Table 3 Correlations of the overall level of online learning self-efficacy and English autonomous learning ability

		English autonomous learning ability	Online learning self-efficacy
English autonomous learning ability	Pearson Correlation	1	.849**
	Sig. (2-tailed)		.000
	N	105	105
Online learning self-efficacy	Pearson Correlation	.849**	1
	Sig. (2-tailed)	.000	
	N	105	105

** . Correlation is significant at the 0.01 level (2-tailed).

To investigate whether there is a correlation between the overall level of university students' online learning self-efficacy and English autonomous learning ability, a scatter plot is drawn using SPSS27.0. From scatter plot of English autonomous learning ability and online learning self-efficacy in Figure 1, it can be seen that the scatter plot of online self-efficacy and English autonomous learning ability has a positive correlation distribution, indicating that there is a positive correlation between the two.

On this basis, Pearson correlation analysis was used to study the degree of correlation between the two. From the Pearson correlation test results of the overall level of online learning self-efficacy and English autonomous learning ability in Table 3, it can be seen that there is a significant correlation between online learning self-efficacy and English autonomous learning ability ($p=0.000 < 0.01$), and the correlation coefficient of the two is 0.849 ($r=0.849 \geq 0.8$), which means a high positive

correlation. That is, the higher the self-efficacy of university students in online learning, the stronger their autonomous learning ability in English. This result is in accordance with the studies of Pintrich & De Groot (1990), Zimmerman (1990), Schunk (1990), Zimmerman & Bandura (1994), Bandura et al. (2003) and Li (2016).

Self-efficacy is at the core of the human self-regulatory system. The data from the analysis showed that self-efficacy for online learning was significantly and positively correlated with autonomous English learning ability. This indicates that self-efficacy, as a special “affective filter,” is closely related to the autonomous learning process and effectiveness of second language learners. The findings also support the inference that self-efficacy, as an important component of Learners’ beliefs in individual differences, can directly or indirectly affect L2 learners’ language learning process (Ellis, 2013).

Table 4 Correlations of online learning self-efficacy and the five dimensions of English autonomous learning ability

		Understanding teaching objectives and requirements	Setting learning goals and learning plans	Using learning strategies	Monitoring learning strategies	Monitoring English learning process
Online learning self-efficacy	Pearson Correlation	.659**	.702**	.709**	.810**	.804**
	Sig. (2-tailed)	0	0	0	0	0
	N	105	105	105	105	105

** Correlation is significant at the 0.01 level (2-tailed).

The correlations of online learning self-efficacy and the five dimensions of English autonomous learning ability in Table 4 shows that there is a significant correlation between the four dimensions of English autonomous learning ability and online learning self-efficacy ($p=0.000 < 0.01$), in which monitoring learning strategies ($r=0.810 \geq 0.8$), monitoring English learning process ($r=0.804 \geq 0.8$) and online learning self-efficacy are highly positively correlated, followed by the using learning strategies ($0.5 \leq 0.709 < 0.8$), the setting learning goals and learning plans ($0.5 \leq$

0.702 < 0.8), and the understanding teaching objectives and requirements ($0.5 \leq 0.659 < 0.8$) are moderately positively correlated with online learning self-efficacy.

This result may be due to the fact that, first, Self-efficacy beliefs also provide students with a sense of agency to motivate their learning through use of such self-regulatory processes as goal setting, self-monitoring, self-evaluation, and strategy use. (Zimmerman, 2000, p.87). As an important intrinsic motivational factor that influences individuals' autonomous learning, self-efficacy significantly influences the setting of learning goals, the use of learning strategies, and the self-monitoring and evaluation of the learning process (Li, 2016). Second, online learning self-efficacy is a good "predictor" of online learning achievement (Tong & Bian, 2005), and self-efficacy can indirectly affect academic achievement by influencing other psychological processes that are closely related to academic achievement, such as motivational attributions, self-monitoring, and goal setting (Bandura & Schunk, 1981; Pintrich & De Groot, 1990; Zimmerman, Bandura & Martinez-Pons, 1992; Tong & Bian, 2005). Thus, self-efficacy for online learning may affect independent learning ability by influencing students' understanding of teaching objectives and requirements, the setting of learning goals and learning plans, the use of learning strategies, and the monitoring of the learning process and learning strategies.

4.4 Regression analysis of online learning self-efficacy and English autonomous learning ability

Table 5 Model Summary^b of online learning self-efficacy and the five dimensions of English autonomous learning ability

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					
					R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
1	.862 ^a	.742	.729	.32179	.742	57.002	5	99	.000	1.577

a. Predictors: (Constant), monitoring learning strategies, understanding teaching objectives and requirements, setting learning goals and learning plans, using learning strategies, monitoring English learning process

b. Dependent Variable: online learning self-efficacy

Table 6 ANOVA^a of online learning self-efficacy and the five dimensions of English autonomous learning ability

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	29.512	5	5.902	57.002	.000 ^a
	Residual	10.251	99	.104		
	Total	39.763	104			

a. Dependent Variable: online learning self-efficacy

b. Predictors: (Constant), monitoring learning strategies, understanding teaching objectives and requirements, setting learning goals and learning plans, using learning strategies, monitoring English learning process

A regression model with the five dimensions of English autonomous learning ability as the independent variable and online self-efficacy as the dependent variable is established through multiple linear regression analysis, and the regression model diagnosis is performed. According to the data in Model Summary^b of online learning self-efficacy and the five dimensions of English autonomous learning ability, it can be seen that R^2 equals 0.742 and the fit is 74.2%, which means that the independent variable can explain 74.2% of the online learning self-efficacy, and that 74.2% of the changes in online learning self-efficacy resulted from the five dimensions of English autonomous learning. According to ANOVA^a of online learning self-efficacy and the five dimensions of English autonomous learning ability in Table 6, the F-value corresponding to the regression equation is 57.002, which corresponds to significance less than 0.05. Therefore, the established regression equation is valid.

Table 7 Coefficients^a of online learning self-efficacy and the five dimensions of English autonomous learning ability

Model		Unstandardized Coefficients		Standardized	t	Sig.	Collinearity Statistics	
		B	Std. Error	Coefficients			Tolerance	VIF
1	(Constant)	.221	.215		1.026	.307		
	understanding teaching objectives and requirements	.218	.071	.206	3.065	.003	.576	1.737
	setting learning goals and learning plans	.073	.074	.081	.997	.321	.392	2.553
	using learning strategies	-.024	.090	-.025	-.263	.793	.283	3.534
	monitoring learning strategies	.355	.114	.358	3.118	.002	.198	5.060
	monitoring English learning process	.316	.092	.345	3.424	.001	.257	3.897

a. Dependent Variable: online learning self-efficacy

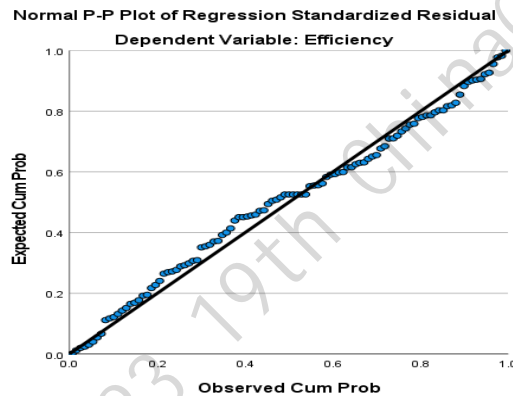


Figure 2 P-P Diagram of the residual distribution of the regression model of online learning self-efficacy and five dimensions of English autonomous learning ability

The Coefficients^a of online learning self-efficacy and the five dimensions of English autonomous learning ability in Table 7 shows that the regression equation: online learning self-efficacy = 0.221 + 0.218 A₁ + 0.355 A₂ + 0.316 A₃, R² = 0.742. A₁ stands for “understanding of teachers’ teaching purposes and requirements”; A₂ stands for “monitoring learning strategies”; A₃ stands for “monitoring English learning process”. Among the dimensions of English autonomous learning ability, “monitoring learning strategies” had the greatest influence on self-efficacy of online learning,

followed by “monitoring English learning process” and finally “understanding teaching objectives and requirements”.

Based on the regression equation, the regression model was diagnosed to determine whether it was reliable. First, whether the variables were independent of each other was judged based on the Durbin-Watson values in Table 5, where the Durbin-Watson value equaled 1.577, which met the requirement of floating around 2.0, indicating that the variables were independent of each other and met the assumption of sample independence. Secondly, whether there is multicollinearity among the variables was judged according to the VIF values in Table 7, where the VIF values meet the requirement of less than 10.0, indicating that there is no multicollinearity among the variables, which is consistent with the hypothesis of sample non-multicollinearity. Finally, according to P-P Diagram of the residual distribution of the regression model of online learning self-efficacy and five dimensions of English autonomous learning ability in Figure 2, the residuals conform to the normal distribution, and it can be considered that the residuals are randomly scattered distribution, indicating that the model matches the data. In summary, online learning self-efficacy = $0.221 + 0.218 A_1 + 0.355 A_2 + 0.316 A_3$ ($R^2 = 0.742$), and this model fits well.

As shown in Table 7, the regression coefficients of the four dimensions of self-efficacy for online learning and English self-learning ability of university students are significant, indicating that understanding teaching objectives and requirements ($p=0.003<0.05$), monitoring learning strategies ($p=0.002<0.05$) and monitoring English learning process ($p=0.001<0.05$) have good predictive validity on online learning self-efficacy .

First of all, monitoring learning strategies and monitoring English learning

process has good predictive validity for online learning self-efficacy because self-efficacy is closely related to self-monitoring skills and the use of learning strategies (Zimmerman & Martinez-Pons, 1990; Pintrich & De Groot, 1990; Bouffard-Bouchard, Parent & Larivee, 1991, 1991; Bandura, 1997).

Second, understanding teaching objectives and requirements also has good predictive validity for online learning self-efficacy because self-efficacy is an important intrinsic motivational factor influencing self-directed learning; the stronger the student's self-efficacy, the higher the learning goals set, and the greater the self-regulation of learning (Schunk, 1990), and self-efficacy directly influences achievement goals (Elliot & Church 1997; Mone, Baker & Jeffries, 1995). This result is also supported by Zimmerman, Bandura & Martinez-Pons (1992) and Yin Rui & Xie Youru (2010)'s study on self-efficacy.

5. Conclusion

This study found that university students' English independent learning ability and online learning self-efficacy are generally at a moderately high level, but there are differences in the levels of different individuals; and that there is a high positive correlation between online self-efficacy and English autonomous learning ability. It also proves that English autonomous learning ability have good predictive validity for online learning self-efficacy.

Therefore, university students can consciously and actively improve their English self-directed learning ability and thus their self-efficacy in online learning by clarifying instructional goals, setting learning goals, effectively using learning strategies, and monitoring the learning process can be improved.

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An analysis of innovative practice and effectiveness of information technology in promoting English learning

PEP Digital Publishing Co., LTD Ge Xin

Information technology represented by artificial intelligence and big data is reshaping the social form, driving profound changes in the education field, and also affecting traditional teaching methods and education models. The multi-dimensional and multi-level integration of information technology and English education has brought new ideas and methods to English teaching and learning, and promoted the efficiency and effect of English learning.

1. The integration of information technology and gamified learning design promotes the joy of learning English

Gamified learning design refers to the design of textbook content and learning activities into gamified activities in the process of designing learning resources according to teaching objectives, teaching content and characteristics of learners. Learning resources make the learning process more interesting through the use of game elements and game mechanisms, so as to motivate learners to participate in the motivation of gamified learning. [1] Numerous studies have shown that games activate the dopamine system in the brain, the pleasure center. "Games make learning a stimulant," wrote Ralph Koster, a famous game designer. [2]

The integration of information technology and gamified learning design enhances the interactivity and interest of learning resources, provides students with an immersive learning experience, improves students' enthusiasm for active learning, enhances students' language practice ability, and promotes students' enjoyment of learning.

The following taking the interesting dubbing module in the PEP Speaking APP as an example as shown in Figure 1, it integrates the content of teaching materials, animation videos of teaching materials, multimedia technology and artificial intelligence technology to realize human-computer interaction and enable students to enter into immersive learning. Students' voices, animated subtitles and animated videos are recombined to form their independent sound creation works. Students participate in the dubbing activities of textbooks and form their own voice works. Compared with the reading activities of texts, they are more interested and have a sense of accomplishment. The following is the animation dubbing activity of the first volume of the third grade of English Textbooks with PEP version, with nearly 190,000 students participating in the dubbing in a single video, as shown in Figure 2. Figure 3 and Figure 4 show the cumulative number of people who accessed dubbing from August in 2019 to May in 2023, with a total of 30.985 million people by Android phone, and there are 21.839 million people participating in dubbing, and 12.897 million output works.

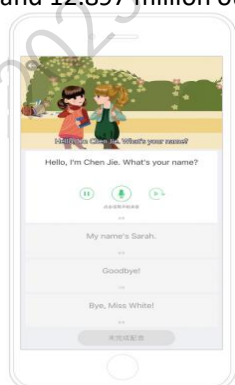


Figure 1. Dubbing module

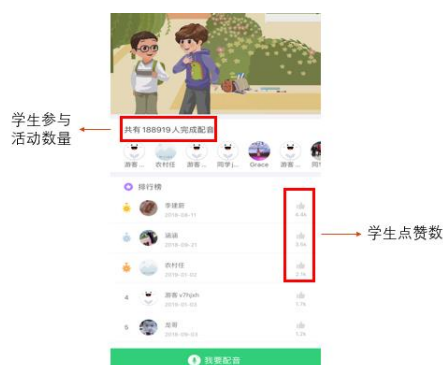


Figure 2. Number of dubbing participants

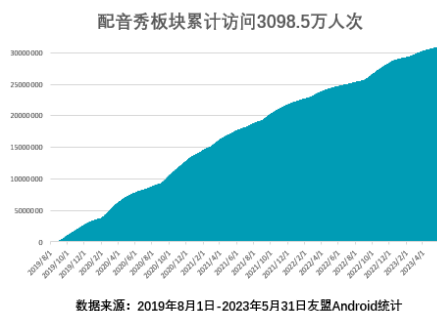


Figure 3. Cumulative number of users



Figure 4. User usage

Through human-computer interaction, students become the protagonist of the textbook and boldly interpret their own English textbooks. The activities are lively and interesting. After completing the dub, they can also sign and share the works, which not only promotes the language output of students, but also promotes the communication and sharing between students, guiding students to learn from each other, influence each other, and like each other. As can be seen from the picture, the top students get a high number of likes. Through gamified interactive activities, students' willingness to learn is enhanced, and it is easier to achieve spontaneous, interesting and continuous learning and promote independent development.

2. The combination of information technology and learning evaluation to promote the integration of "teaching-learning-evaluation"

Information technology empowers education, providing convenient and timely feedback functions and evaluation tools for online learning. Integration with information technology can record students' learning process and results through data embedding; through visual design, it is easy to view students' learning situation and understand their strengths and weaknesses; through the evaluation feedback results, you can get targeted personalized guidance; through data statistics, it is convenient for teachers to query teaching effect data, provide a basis for teachers to adjust teaching strategies and methods, and provide improvement direction for teachers' teaching.

For example, the PEP Speaking APP has designed progressive English learning challenges such as vocabulary evaluation (see Figure 5), sentence evaluation (see Figure 6), and complete conversation evaluation (see Figure 7). Gamified man-machine dialogue not only helps students improve the frequency of English listening and speaking and overcome the psychological barrier of opening expression, but also easily helps students find which syllables are difficult to pronounce, which words are easy to spell wrong, and which content is not easy to understand. For pronunciation errors and other problems, the student will get timely feedback, which will help students understand the problem, trigger students to think further, and then solve the problem. Teachers can also improve teaching strategies and methods by analyzing students' problems through data statistics. "Entertaining instruction can lead to deep learning if learners are given regular feedback on their performance." [3] The gamified form of human-computer interaction not only promotes students' continuous learning and development, but also provides a basis for teachers to adjust teaching strategies and promote the benign development of "teaching-learn-evaluation".



Figure 5. English vocabulary pronunciation evaluation

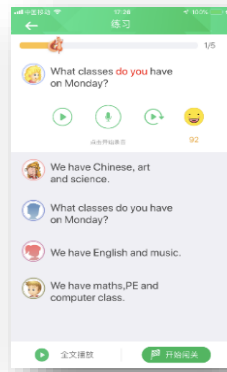


Figure 7. English dialogue evaluation

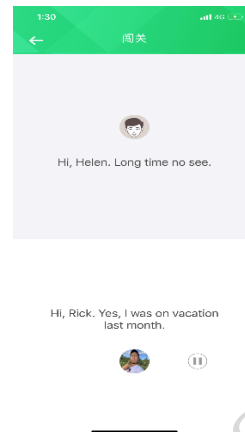


Figure 6. English dialogue evaluation

The following is an example of the oral English module in PEP Speaking APP. It provides nearly 2000 sets of situational dialogues around various scenarios of students' life, including students' school life, family life and social life, in the form of "practices" and "pass", for students to conduct human-computer interaction training, as shown in Figure 8. Among them, practices are evaluated and scored in sentence dimension, while passing is an overall evaluation of the complete dialogue in the form of role playing. The evaluation is evaluated from multiple dimensions such as students' pronunciation and intonation, accuracy and fluency of oral expression, so as to develop students' oral expression ability, improve language application and transfer ability, and promote the development of students' autonomous learning ability. It is conducive to personalized learning effect.

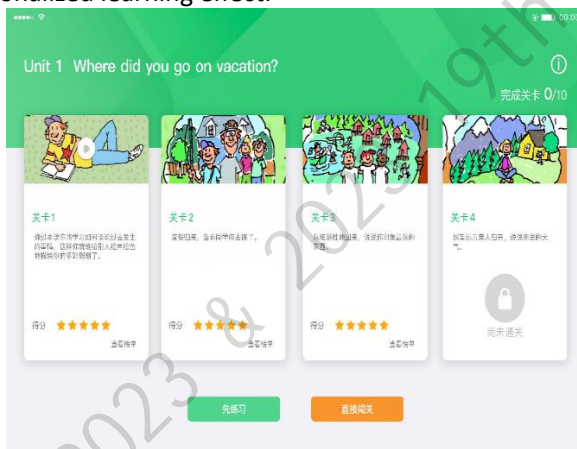
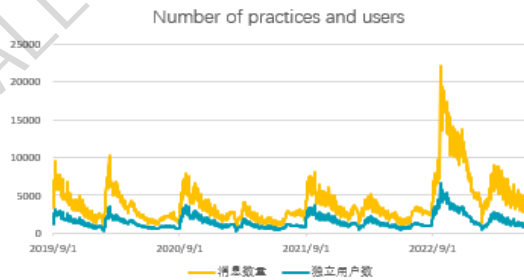
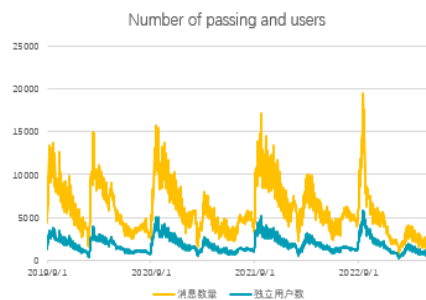


Figure 8. Practice and passing



Data source: Android Statistics from September 1, 2019 to May 31, 2023

Figure 9. Number of practice users



Data source: Android Statistics from September 1, 2019 to May 31, 2023

Figure 10. Number of pass users

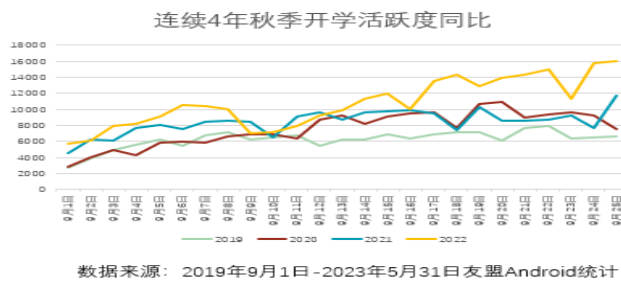


Figure 11. Comparison of user activity in the beginning of the semester

As can be seen from Figure 9 and Figure 10, the number of users using "direct pass" in oral English is 1.4 times higher than that of "practice first", and the number of users is 1.2 times higher. Both the number of uses and the number of users have steadily increased since September 2019. In Figure 11, through the comparative analysis of active user data from September 1 to September 25 for four consecutive years, it can be seen that the oral practice module has achieved continuous growth at an average growth rate of 20% for four consecutive years, with a peak of 16,000 people/day. It can be seen that the use of information technology to achieve human-computer interaction training is very popular with students.

The learning evaluation provided by information technology can support classroom teaching and students' independent learning after class, provide students with personalized learning scenarios, record students' personalized learning data, facilitate students to query, reflect, and review learning results, and meet students' personalized learning needs. In the interaction with products or with peers, fully mobilize students' interest, give full play to students' autonomy, stimulate students' potential, mobilize students' internal drive, let students become the master of learning, realize real learning, and fully reflect the concept of student-centered education.

3. The integration of information technology and learning strategies can improve the efficiency and effectiveness of English learning.

English learning, which integrates information technology and English learning strategies, can fully mobilize the multi-sensory abilities such as vision, hearing and touch, promote the horizontal link and vertical correlation of English knowledge, and effectively improve the efficiency and effect of English learning. Information technology can maximize the value of education only when it is integrated with the learning strategy of the subject. Taking English vocabulary learning as an example, the integration of information technology and learning strategies can effectively solve vocabulary problems that often confuse students but are difficult to solve.

3.1 The integration of information technology and vocabulary learning strategies is helpful to realize the overall learning of sound, form and meaning of vocabulary and improve the memory effect. First of all, information technology can realize the speech playback and follow-up function of words, which can improve the recognition of vocabulary and speech, and promote the accuracy and fluency of students' pronunciation. Students can imitate the correct pronunciation and master the pronunciation skills through the practice of following and reading. Secondly, it can help students deeply understand the relationship between pronunciation and form, and summarize the pronunciation and spelling rules. Through the correspondence between word pronunciation and spelling, students can quickly master the spelling rules and greatly improve the automatic degree of vocabulary memory. Thirdly, the application of multimedia technology makes pictures and videos more convenient and efficient in conveying the meaning of words and using scenes, helping students to accurately understand the meaning of words. In the interactive learning of pictures and videos, students can fully mobilize the multi-sensory abilities such as vision, hearing and touch, enhance the desire for imitation and expression, and improve the ability of vocabulary transfer and application. Finally, with the help of the voice evaluation

function of artificial intelligence, students not only know the accuracy of their pronunciation, but also continue to practice according to the prompts of pronunciation problems, so as to correct mistakes and promote learning.

Take the “mouth” of the word module in the "PEP Speaking" APP as an example. As shown in Figure 12, it aggregates the multi-dimensional learning content of words such as picture, pronunciation, follow-up reading and example sentence, and displays the sound, shape and meaning of words in a functional module as a whole, constructing the horizontal connection of vocabulary ontology, and making vocabulary learning more concrete, visualized and interesting. The pictures are vivid, impressive and not easy to forget. The application of phonics can split and mark words according to phonemes, help students find the rules of pronunciation and spelling of words, and realize the effect of listening to the sound and reading the word. Through the following reading exercises, students can see the timely evaluation feedback, which arouses students' desire to express, enhances their interest and confidence in English learning, and is conducive to improving the learning effect of vocabulary.

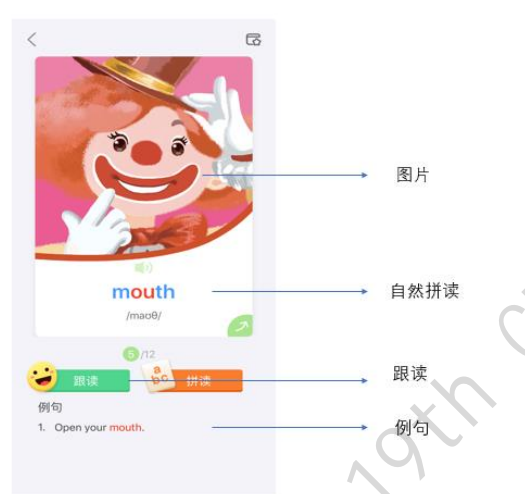


Figure 12 Word learning

The integration of information technology and English vocabulary learning strategies makes abstract content concrete, static content dynamic, and multi-dimensional content integrated, which accords with the law of students' psychological development, facilitates students to imitate and learn, and gradually gets rid of the influence of their mother tongue, helps to solve the difficulty of vocabulary not easy to remember and forget, and improves the effectiveness of vocabulary learning.

3.2 Through mobile Internet and other information technology to achieve effective correlation between vocabulary, promote students to build vocabulary knowledge network, enrich vocabulary accumulation. Knowledge acquired on the basis of unrelated structures is easily forgotten, and knowledge without interconnection has a very short half-life in memory. [4] Therefore, building associations and forming a vocabulary knowledge network is the key to students' lasting memory and transfer in vocabulary learning. The application of information technology such as mobile Internet, big data, and cloud computing can associate relevant information such as words and phrases, vocabulary and derived words of different dimensions and the same topic, and present and serve students according to different trigger conditions.

3.2.1 Subject vocabulary can be related learning, effectively expand students' vocabulary. The learning strategy of thematic vocabulary refers to the method of learning and memorizing the vocabulary of the same topic or the same topic in English. Mobile Internet technology can logically correlate and quickly link vocabularies to build theme-based vocabulary families and vocabulary knowledge networks for students to efficiently search and learn, instead of looking up dictionaries and textbooks to find individual subject vocabularies. Therefore, students' learning

efficiency is greatly improved. Through this connection and link, students can not only understand the macro framework of subject vocabulary, but also learn specific word learning resources, thus deepening their understanding of subject and vocabulary. In vocabulary use, students can quickly activate theme-related vocabulary. Take the "Youdao Children's Dictionary" APP as an example. When you search bamboo, plant-related terms can be displayed by linking to each other, as shown in Figure 13 below, such as bark, blossom, branch, bud, and evergreen. pine, bush, trunk, root, leaf, sprout, stem, flower, etc. These words are related to each other under the theme of plants, so that students have an overall understanding of plant words, facilitate students' overall understanding and deepen their memory.



Figure 13. bamboo related subject words



Figure 14. bag phrase collocation

The learning strategy of thematic vocabulary is not to memorize one word by one word, but to let the brain memorize the whole vocabulary according to the theme, so as to help students establish a relatively complete vocabulary network. Information technology provides great convenience for the overall learning of topic vocabulary, which is conducive to the transformation of students' vocabulary knowledge from "passive" to "active" and helps students to extract and use vocabulary in expression.

3.2.2. It can build associations such as collocation phrases and derived words to enrich students' language accumulation and improve vocabulary use ability. Information technology can quickly build and associate phrases, derived words, etc. with the beneficial expansion content of vocabulary, extend vocabulary from one to the other, from tables to inside, trigger students' imagination and thinking about life scenes and English expressions, diverge students' thinking, and enrich language accumulation. Figure 14 is the page of learning "bag" in the "Don't Remember Words" APP, which associates vocabulary with common phrases in daily life, showing common phrases such as a plastic bag, a rubbish bag, pack a bag, cosmetic bag, a make-up bag, and a bag of chips. At the same time, it is also associated with the derived word bag, such as handbag, luggage, baggage and so on. While learning vocabulary, students directly or indirectly learn the expression methods of common phrases and the morphological changes of derived words, which helps students accumulate more vocabulary and more expressions, which not only rapidly expands vocabulary, but also deepens the understanding of vocabulary use, improves the diversity of expressions, and enhances the confidence of language learning.

The integration of information technology and English education has brought new ideas and methods to English teaching and learning, enhanced students' interest and confidence in English learning, promoted the change of students' learning styles, promoted students to change from passive learning to active learning, and promoted students' personalized learning and growth. With the development of information technology, there will be more ways to explore improving the efficiency and effectiveness of English learning.

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Implementing assessment as learning in online EFL writing classes

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Abstract

This article describes the implementation of assessment as learning (AaL) in an online English-as-a-foreign-language (EFL) writing course at a university in China. The authors observed that challenges from both the university administration and students were found when integrating AaL into face-to-face writing classrooms, including failure to offer prompt feedback due to packed course syllabi and large class sizes as well as students' low engagement due to insufficient English ability and shyness. An online teaching innovation was therefore made to tackle these problems. Key steps of the online AaL-focused writing process included (1) establishment of writing goals with peers and teachers through online forums on learning management

system (LMS) and live-broadcasting platforms, (2) instructional scaffolding of genre knowledge and writing strategies via videos and quizzes in LMS before writing, (3) self-assessment, peer-assessment and teacher feedback during writing via online document editors and online chat rooms, and (4) self-reflection after writing. Data including a post-course survey and student interviews showed that the online formative assessment practices facilitated the implementation of AaL strategies and improved students' learning by offering timely focused feedback, creating personalized learning experiences, and encouraging learner engagement. Implications for applying AaL in a blended EFL writing classroom during the post-pandemic era are discussed.

Keywords

Assessment as learning, formative assessment, online teaching, EFL writing, blended learning

1. Introduction

As an assessment approach aiming at promoting students' learning and fostering self-regulated learners, assessment as learning (AaL) has attracted attention in recent decades (Earl 2013). However, challenges from both the university administration and students were found in putting it into practice in English-as-a-foreign-language (EFL) classrooms, including failure to offer prompt feedback due to packed course syllabi and large class size as well as students' low engagement due to insufficient English ability and shyness. Against these backdrops, our study found that online formative assessment practices facilitated the implementation of AaL strategies and improved students' learning by enabling timely focused feedback, offering personalized learning experiences, and engaging students. This paper introduces and reflects on the implementation of AaL in an online EFL writing course at a university in China.

2. The Teaching Context

This innovation was carried out in *English Writing*, a compulsory course for second year English majors in a mid-tier private university in south China, with a total of 265 students in three classes. After receiving approximately 10 years of English training in EFL classes, their English proficiency levels ranged from A2 to B1 on the Common European Framework of Languages. With a mean age of 19, students were competent in using Informational Communication Technology tools (ICT tools) such as computers and Internet. Since assessment of learning (AoL), i.e., using writing tasks to make summative judgements about writing performance (Parr, 2013), rather than AaL is frequently employed in EFL writing in China (Guo & Xu, 2020), students tended to be reliant on teacher feedback.

After the 16-week (1.5 hours per week) course, students were expected to master

the basic skills for writing argumentative essays. Their writing tasks were two argumentative essays (one-sided and two-sided argumentation) of no less than 250 words, with four drafts for each argumentation. A genre-process approach was adopted in implementing AaL including (1) establishment of learning goals of argumentative writing with peers and the teacher through analyzing sample essays, (2) instructional scaffolding of genre knowledge and writing strategies before writing, (3) self-assessment, peer-assessment and teacher feedback during writing, and (4) self-reflection after writing (Author et al, 2021; Lee, 2017).

3. Reason for the Innovation

When we integrated AaL into EFL face-to-face writing classes, impediments were confronted from both the university administration and students. First, at the university level, teachers found it difficult to provide timely focused feedback due to the constraints of the jam-packed syllabus and big class size. Since only this writing course was offered to students before they learnt how to write academic papers in year 3, this course covers all the genre knowledge and writing strategies about essay writing (see supplementary material). The pack syllabus left little time for AaL writing activities. Besides, a teacher usually must take up two or three classes within one semester, with around 40 students in one class in the university. Similar to previous studies (Author et al., 2020; Lee, 2017), the overloaded teaching content and big class size discourage teachers from providing timely and focused feedback in class.

Second, at the student level, English proficiency and culture difference pose challenges. In line with prior research (Lee et al., 2019; Xiang et al., 2022), class observation found that students with low to medium English proficiency had

difficulty in carrying out peer assessment and taking charge of their learning. Despite teachers' modeling in class, most students needed more time to assimilate writing strategies and develop their assessment abilities before they can independently engage in peer/self-assessment. In addition, influenced by an Asian culture that stresses humbleness, most Chinese students felt reserved to speak up their views in physical classes although AaL encourages students to voice their opinions to co-construct assessment criteria with the teacher. They were also reluctant to point out weaknesses of their peers' essays in face-to-face situations.

These challenges could be solved by the recent development of online teaching and assessment. Firstly, online formative assessment was found to offer students valuable learning experiences by providing formative and immediate feedback (Gikandi et al., 2011). Secondly, the data-driven continuous assessment techniques may create personalized learning experiences by keeping students engaged with the course material (Shute & Rahimi, 2016); Thirdly, the computer-mediated peer feedback seemed to suit students who feel constrained to give feedback in face-to-face context (Ho & Savignon 2007).

Meanwhile, recent advancement of ICT in China, such as automatic writing evaluation (AWE) platform (e.g., Pigai), live streaming platform (e.g., Dingding), learning management systems (LMS, e.g., Xuexitong), online document editors (e.g., Tencent Docs), and online learning platforms (e.g., iCourse) has made implementing AaL in online context possible.

This online teaching innovation aims at enriching the enactment of AaL practices in a Chinese university context by offering students personalized learning experiences, timely focused feedback and boosting learner engagement.

4. Description of the Innovation

Orientation and writing pre-test

To provide students with a sense of security and direction, we conducted course orientation and a pre-test in the first meeting. First, a video was presented to explain the concept of AaL and the teaching design to help students understand their roles in taking charge of their learning and view self-/peer-assessment as an integral part of their learning. Second, to identify students' weaknesses in argumentative essays, a writing pre-test was conducted on Pigai (AWE, <http://pigai.org/>), which analyzed and summarized students' language errors and dataficated their learning (see Figure 1).

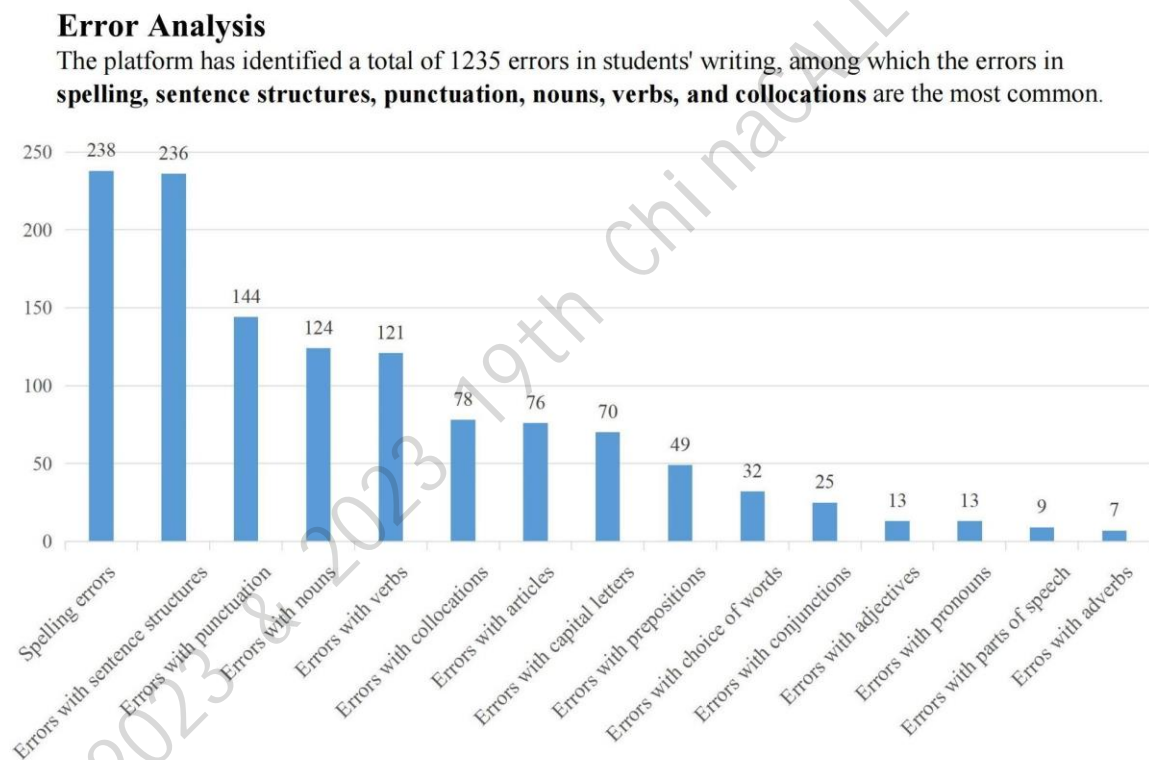


Figure 1. Error analysis sheet in Pigai (original in Chinese)

Through teachers' online review on the content and rhetorical issues, weaknesses in thesis statement, essay organization, cohesion and coherence were identified and thus would be particularly discussed in this semester. These areas of weaknesses were shared with students so that they know where to head towards.

The section below describes how the online teaching design guided students

through an AaL-focused writing process.

Phase 1- Establishment of Learning Goals Before Writing

To let students know where to go before writing, they were invited to share learning goals with peers and the teacher through LMS forums, group chatting and time-sync comments on live-broadcasting platforms. Before the lesson, students first post their analyses of a good argumentative sample essay in areas of content, structure and linguistic features in LMS (e.g., Xuexitong, see an example in Figure 2).

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Please analyze the sample essay below and summarize the features of a good one-sided argumentative essay.

Student Name: Judy(pseudonym)

Artificial Intelligence Won't Make Our Brains Lazy

Great achievements have been made in the field of artificial intelligence and artificial intelligence is taking over many human jobs. Some predicts that our brains will regress artificial intelligence can plan and organize for us. In my view, even though intelligent machines are getting better and smarter, our world won't be like some science-fiction where human brains are inferior.(thesis statement)

First, interactions between human beings can never be replaced by machines(point). Though the electronic assistants can plan and organize a dinner party for us, it is beyond their abilities to communicate and interact with guests like us. It is unlikely for intelligent machines to develop human-like social competence which consumes a lot of brain work(exemplification/comparison). Second, artificial intelligence, no matter how superior, needs us as much as we need them(point). The computer-based artificial intelligence has to depend on humans for maintenance to ensure its survival. It requires our supplies and repairs; thus, our brains are going to keep pace with the artificial intelligence (cause and effect).

内容丰富，开头两句简要说明了现状然后提出自己的观点并且进行论证。语言没有过多的语法错误，连接词运用得体。

Translation: The essay content is rich. The author explains the current situation in two sentences briefly and then put forward the thesis followed by elaboration. There are no excessive grammatical errors in the language, and the connectors are used appropriately.

In conclusion, the concern about whether artificial intelligence will make our brains lazy is caused by an overestimate of the impact of technology on human beings and a lack of vision about human intelligence. After all, human brains will also evolve as the development of artificial.

结构清晰，逻辑性强，开篇提出观点，后面用 first 和 second 两段来论证观点并且运用了举例，对比和因果论证的方法，观点和论证内容具有说服力。

Translation: The essay is clearly structured, logical connected. The viewpoint is proposed at the beginning followed by two supporting paragraphs, and examples, comparison and causal argument are used to demonstrate the viewpoint. The argument is convincing.

优秀的议论文应该：

- 1、要在文章中亮出自己的观点
- 2、论证充分，有说服力
- 3、结构清晰，逻辑性强，连贯性好
- 4、几乎没有语法上的错误
- 5、用词确切，语言得体

Translation:

A good argumentative essay should:

Show your opinion in the article

The argument is sufficient and persuasive

Clearly structured, logical connected and coherent

With few grammatical errors

Figure 2. Student's analysis on a sample essay

In the proceeding online lesson conducted on Dingding (a MIC-connected live-broadcasting platform which allows viewers to conduct group

chatting, review live recordings and contribute their views through time-sync comments and interactive live broadcasting), students shared their analyses with peers during group chatting and post their discussion results on LSM forums. Then, with reference to the sample essay, teachers commented on each group's works and devised a final version with the whole class (see Figure 3).

Genre	Purpose	Structure	Language features
One-sided argumentation	<p>To put forward a point of view and provide logical, detailed support for your argument</p> <p>To develop a paragraph by giving examples and writing a list of points to support the topic sentence</p>	<p>Introduction (opening remarks+ thesis statement)</p> <p>Supporting paragraphs (topic sentence + topic sentence expansion +examples/other methods + concluding sentence)</p> <p>Conclusion (restatement of thesis+ closing remarks)</p>	<p>Connectors for adding information and introducing examples</p> <p>Verbs and phrases for summarizing and taking a stand</p> <p>Grammar points:</p> <p>Passive voice</p> <p>Sentence punctuation</p>

Figure 3. Learning goals offered by the teacher

This process was live broadcast through screen sharing, during which students answered questions and contributed ideas via time-sync comments. Finally, students set up their own essay writing learning goals in a goal-setting sheet (see Figure 4).

Goal-setting Sheet

Name: Lilian(pseudonym)

Before writing (Where am I going?)

Instructions: Based on your pre-test and the features of a good argumentative essay discussed in class (see Table 1), please write down your personal learning goals for this essay. Then, think about how to achieve these goals (see Table 2 for recommended strategies).

Personal learning goals		Strategies
Content	I will give some specific examples to support my thesis sentence and argument	<ol style="list-style-type: none"> 1. Examples from many aspects, such as life, reading books 2. Start with a summary and a clear point 3. Articulate sentences
Structure	Strengthen the logic of the whole article	<ol style="list-style-type: none"> 1. An outline 2. From broad to specific, from small to large 3. Use connectives well 4. Use point-reason-example 5. A three-stage
Language use	Use appropriate and varied words, rather than simply repeating certain words	<ol style="list-style-type: none"> 1. Some sentences with complex structure, rich meaning and proper hierarchical processing are used 2. Use some of the most idiomatic and colloquial phrases in English 3. Correct use of some fixed collocations in English
Others	Rich in content and Writing specifications	<ol style="list-style-type: none"> 1. Give persuasive examples 2. Use proper punctuation

Figure 4. A sample of students' goal-setting sheet

Phase 2 - Instructional Scaffolding of Writing Knowledge and Strategies

To offer more support and time for students to assimilate writing knowledge and strategies, a total of 25 MOOC videos and micro-lessons made by the teachers on genre knowledge (e.g., thesis statement, topic sentences and supporting evidence) and process writing strategy (e.g., drafting, revising and editing) were posted in LMS. These videos could be previewed and reviewed outside of class whenever students needed supports. Online quizzes and/or writing tasks were given after each video to monitor students' learning. Meanwhile, teachers monitored students' performance in LMS to identify students' knowledge gap and design scaffolding activities accordingly in the coming lesson. For example, we found from a pre-class task of

writing thesis statement that most students failed to write subtopics in paralleled structures and thus decided to further explain parallelism. During the next online lesson, students were assigned to comment on and revise peers' thesis statements via Tencent Docs (a web-based platform to create, share and edit documents online), which allowed the teacher to view and offer feedback on peer feedback simultaneously to consolidate this genre knowledge (see Figure 5).

Name	The First Draft of Your Thesis Statement	Peer Review	Teacher Comment	Your Revised Thesis
John (pseudonym)	As far as I'm concerned, developed countries should take more blame for slowing climate change because of the CBDR principle of international environmental law and their economic development on the premise of destroying the environment.	The reason is not clear and difficult to become sub-claim.	I agree. Subtopics can be general terms in paralleled forms.	As far as I'm concerned, developed countries are supposed to take more blame for slowing climate change because of the national strength condition, legal liability and historical responsibility.

Figure 5. In-class peer assessment on thesis statement on Tencent Docs

Phase 3 - Self-assessment and Peer-assessment

After the scaffolding activities, students produced Draft 1 and assessed their essays against an electronic self-assessment form adapted from Lee (2017). Students assessed their performance with reference to assessment criteria, wrote commentaries about their strong and weak points in content, structure and language, and then noted down approaches to solve these problems (see Figure 6). Online tools such as Pigai (AWE system) and Thesaurus were introduced to encourage students to check language accuracy and diversify lexical choices on their own. Based on self-assessment results, students revised Draft 2.

Assessment criteria for two-sided argumentation

Date: xxx Writer's Name: Nancy (pseudonym)

5=Excellent, 4= Good, 3=Average, 2= Room for improvement, 1=A large room for improvement

I can	5	4	3	2	1	Comments
Content and Structure						
Provide relevant background about the topic in the introductory paragraph.			√			Strengths: write a well-form thesis statement in the introductory paragraph; use connectors; write topic sentence Weaknesses: be difficult to use various ways to support my topic sentences and be uneasy to summarize the materials Solution: review the PPT for 7 ways to support the topic sentences; do more exercise to improve the ability of summary
Write a well-formed thesis statement in the introductory paragraph.		√				
Support the thesis with a few major arguments in supported paragraphs in the form of topic sentences.			√			
Use various ways to illustrate and substantiate topic sentences (e.g. with supporting details).				√		
Compare ideas by similarity-difference pattern, point-by-point organization or block organization.			√			
Restate the thesis and conclude the argument clearly and strongly – e.g., with a recommendation, a thought, or a comment.				√		
Language						
Use verb tense and forms correctly.		√				Strength: use verb tense and forms correctly Weaknesses: be difficult to use different words to enrich my writing; hard to use various sentences appropriately Solution: accumulate vocabulary and learn more passages' sentence pattern.
Use appropriate words according to the context		√				
Use a range of appropriate words to compare lives in different contexts and discuss your preferences.				√		
Use comparison and contrast structure words to discuss similarities and differences appropriately.				√		
General comments: Should especially focus on the learning of vocabulary and sentence pattern.						

Figure 6. A sample of students' self-assessment form

During in-class online peer assessment, a screencast video with spoken comments and on-screen actions was presented to offer assessment training, in which the teacher modeled feedback delivery in terms of how to give focused and diagnostic written feedback as well as how to conduct English oral feedback to seek clarification. Then, students in groups of three gave written peer feedback (see Figure 7) on Draft 2 in a co-editable Tencent Docs, with oral peer feedback conducted and videoed in online chatting rooms. After class, students wrote their Draft 3 accordingly and submitted

their drafts with peer feedback videos to the teacher.

Assessment criteria for one-sided argumentation

Date: xxx Writer's Name: Jenny(pseudonym) Reviewer's Name: Lucy(pseudonym)
 5=Excellent, 4= Good, 3=Average, 2= Room for improvement, 1=A large room for improvement

The student writer can	5	4	3	2	1	Comments
Content and Structure						
Provide relevant background about the topic in the introductory paragraph.	√					Strengths, weaknesses and advice: There is an introduction at the beginning, but the thesis statement is not very clear. No topic sentences in each paragraph.
Write a well-formed thesis statement in the introductory paragraph.		√				
Support the thesis with a list of arguments in supported paragraphs in the form of paralleled topic sentences.				√		
Use various ways to illustrate and substantiate topic sentences (e.g. with supporting details).		√				
Use various ways to enhance coherence and cohesion.						
Restate the thesis and conclude the argument clearly and strongly – e.g., with a recommendation, a thought, or a comment.		√				
Language						
Avoid run-on sentences correct.			√			There are rich vocabulary and various sentence patterns, but there are some grammatical errors.
Use passive voice correctly.	√					
Use synonyms to demonstrate vocabulary richness.	√					
Use connectives appropriately to link up and develop arguments.		√				
General comments: Introduction at the beginning, but the thesis statement is not very clear. No topic sentences in each paragraph. Rich vocabulary and various sentence patterns, but there are some grammatical errors.						

Figure 7. A sample of students' peer-assessment form

Phase 4 - Teacher's Feedback and Self-reflection

Teachers' electronic individual written feedback was returned to students via LMS (see supplementary material) prior to an online feedback conference where comments on the overall writing performance of the whole class were given in areas of content, organization and language use. Students constantly engaged by answering questions or contributing ideas on the live broadcasting platform, e.g., offering synonyms to improve vocabulary richness for sample essays through time-sync comments (see Figure 8).

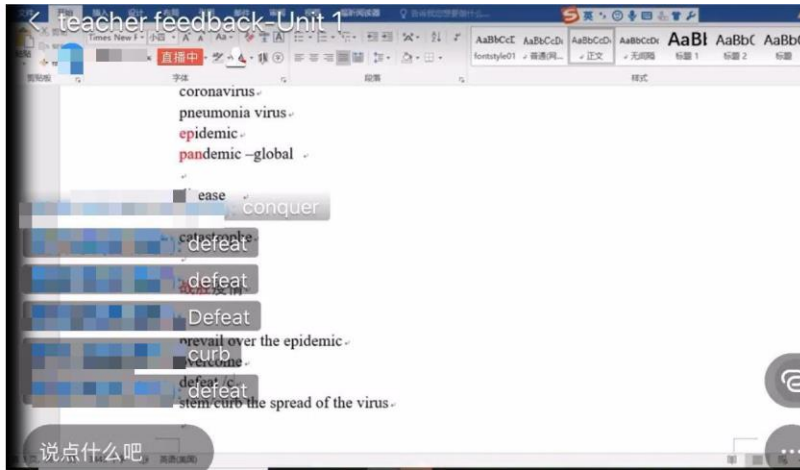


Figure 8. A screenshot of a live-broadcasting lesson on post-writing teacher feedback

At last, students revised their final drafts accordingly after class, reflected on their gains (e.g., lexis, syntax and writing strategies) and learning goals, and write future writing plans (see Figure 9).

Reflective journal

Name: Jack(pseudonym)

After writing (Where to next?)

Three most important things I learnt about writing:

1. The thesis statement within parallel structure.
2. The structure of whole article.
3. How to display the opinions and evidences.

Three most important things I have learnt about words, phrases and sentences:

1. Use the synonyms to express the same thing
2. Many useful sentence patterns to improve the sentence
3. Many phrases of transitional expressions.

Three most serious error types I have learnt from peer and teacher feedback:

1. Some words are out of context.
2. Some expressions are Chinglish.
3. Some uses of grammar are wrong.

Please reflect on your learning goals (What goals did you achieve? What are the strengths of my writing? What goals did you fail to achieve? What are the weaknesses of my writing?):

1. I achieved: clear structure/ various word expressions/ transitional words
2. Strengths: clear structure/ use of attribute clause
3. Fail to achieve: clear thesis statement/ the summary isn't simple enough.
4. Weakness: the sentence expression isn't various enough.

Further goals for the next composition:

1. Clear structure and thesis statement
2. Use different kinds of sentence expression.
3. Have a nice summary.

Figure 9. A sample of students' post-writing reflective journal

5. Reflection

Generally speaking, the online AaL writing innovation has yielded promising results to students' learning based on the post-course survey and student interviews.

Firstly, videos in LMS and affordance of ICT tools in online AaL classes made prompt and focused feedback possible in a big-sized class. To begin with, the

instructional scaffolding videos allowed students to learn about genre knowledge and writing strategies before or after class, which leaved more class time to feedback activities. Moreover, prompt written peer assessment and teacher's written feedback on peer assessment were achievable thanks to synchronized function of online document editors and LMS forums. For example, as shown in Figure 5, teachers can create an online co-editing Tencent Docs to collect peer feedback on thesis statements and make comments immediately in class. Students had access to classmates' writing drafts, peer feedback and teachers' feedback on peer feedback syn-chronically so that they were exposed to more learning resources. In a word, videos and ICT tools used in online classes can improve feedback efficiency (Zou et al., 2019). Moreover, assessment information informed teachers of students' performance so that we could adjust teaching goals accordingly. For example, weakness in writing subtopics for thesis statements were found on LMS so we devised exercises on parallelism.

Secondly, instructional scaffolding from online AaL lessons can offer personalized learning experiences. In the post-course survey, 84 % of the 235 respondents indicated positive attitudes towards the online class, among which 28 % expressed a sense of autonomy in the ICT-assisted writing activities, while 52 % of them appreciated the storing and retrieving function of live-broadcasting lessons and online videos because they could refer to the videos at any writing process according to their needs. For example, one student commented that:

I was given more autonomy because I could use different learning platforms on my own, play back the live-broadcasting lessons and refer to the videos or other materials shared online anytime when I cannot catch any points in class. Besides, I could take a screenshot whenever I found necessary, which made it easier to follow my teacher and take notes compared with sitting in a large classroom.

(Johnny, student interview)

Data from LMS showed the average rumination ratio (video viewing duration/actual video duration) of the 25 videos was around 140%, which indicated that almost half of the students have re-watched the videos after class. Consistent with the LMS data, one student named Emily said in her interview that: “After self-assessment, I re-watched videos of topic sentences shared on the platform to enhance coherence”.

Thirdly, time-sync comments in synchronized online lessons and forums in LMSs during AaL course promoted students’ engagement. For one thing, students commented in the post-course survey that they were much more willing to respond to teachers by typing out their ideas through time-sync comments compared with speaking out in a face-to-face classroom. As shown in Figure 8, in a post-writing teacher feedback section to enhance vocabulary richness for an essay, students contributed five synonyms for the phrase “fight against the pandemic”.

For another, online forums boosted students’ engagement in pre-writing learning activities where they actively shared essay ideas/resources in LMS. For example, 49 entries have been contributed by a class of 78 students for relevant English articles on the writing topic (see Figure 10) and this activity was rated as very helpful in boosting vocabulary in students’ post-course survey.

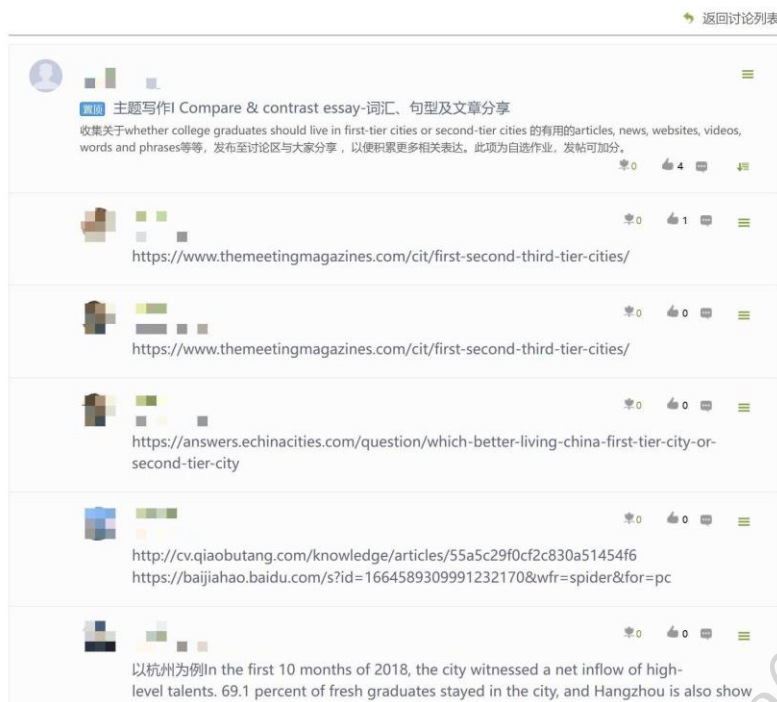


Figure 10. A screenshot of resource sharing in LMS

All in all, the online AaL writing course was found to improve learning by enabling prompt focused feedback, offering personalized learning experiences, and engaging students. As one student Lucy noted in her communication with the instructor after the course:

I used to simply imitate sample essays, but now I've learnt to understand why it is written in this way through engagement and reflection in the course. When I am writing an essay now, I would recall what I've learnt and became much more confident in writing!

Despite the positive effects brought by the online AaL practices, some problems still cannot be solved. For example, although students' engagement in written peer-assessment has been improved, their oral peer-assessment was less effective compared with the face-to-face classes where the teacher can monitor the process, participate in their discussion and offer help in time. Most of submitted oral peer-assessment videos were found in patterned dialogues in which students repeated

their written feedback. Besides, some students indicated negative perceptions towards online lessons due to a lack of direct human interaction.

6. Future pedagogical directions

This study can shed light on the implementation of AaL in EFL writing in the tertiary context. When face-to-face classes are resumed in the post-pandemic era, pros and cons of online AaL practices in this study can help instructors apply AaL in a blended teaching model (see Figure 11).

Before writing, students could share their sample essay analyses and discuss the common features of a genre through online forum, while establishment of learning goals with peers and teachers is preferable in face-to-face class. Besides, instructional scaffolding of genre knowledge and writing strategies could be delivered online through videos due to its convenience in storing and retrieving information as well as datafication of personalized learning experience.

During writing, assessment training could be conducted online through screencast videos so that students can re-watch them according to their needs. In comparison, peer-assessment may be more productive in a face-to-face mode where the teacher can monitor the process and offer help in time. Besides, online document editors could be used to present written peer feedback synchronously so that prompt written teacher feedback on peer feedback is possible. In addition, teachers could decide whether to offer teacher feedback online or offline according to course arrangement. During whole-class teacher feedback, teachers can use forums in LMS to solicit time-sync responses from students (e.g., quite Asian students). After writing, students could reflect on their writing and publish their final drafts online.

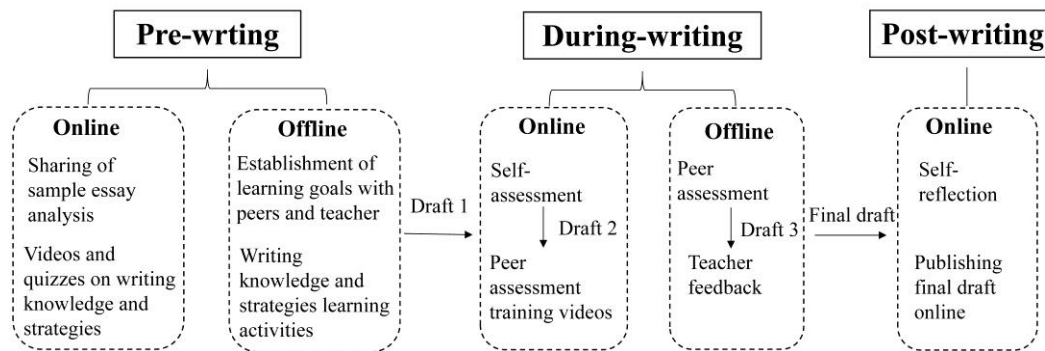


Figure 11. AaL-focused writing process in a blended teaching model

In summary, in a blended AaL writing course, online instructional scaffolding may provide students with more autonomy over their learning and allow efficient use of teachers' time. Online forums in LMS can establish platforms for students to discuss, reflect and share experiences in a supportive classroom community (Lee, 2017). On the other hand, activities which require teacher-student/student-student cooperation (e.g., establishment of learning goals, peer assessment) can be done offline so that students can get timely feedback and hands-on training from teachers and peers.

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Supplementary material

Appendix 1. Course Syllabus for English Writing

Week	Content
1	Course overview & Pre-test
Topic Writing I. One-sided argumentative essay	
2	Pre-writing I: Setting success criteria for one-sided argumentative essay
3	Pre-writing II: Thesis statement (how to write a claim)
4	Pre-writing III: Essay structure (how to support a claim)
5	During-writing I: Self-assessment (effective reasoning)
6	During-writing II : Self-assessment (cohesion & coherence)
7	During-writing III: Peer assessment
8	During-writing IV: Teacher feedback
Topic Writing II. Two-sided argumentative essay	
9	Pre-writing I: Setting success criteria for two-sided argumentative essay
10	Pre-writing II: compare and contrast sentences
11	Pre-writing III: compare and contrast patterns
12	During-writing I: Self-assessment (Vocabulary richness)
13	During-writing II: Self-assessment (Sentence variety)
14	During-writing III: Peer assessment
15	During-writing IV: Teacher feedback
16	Summary & Post-test

Appendix 2. Sample teacher feedback

Teacher assessment form

Date: _____ Writer's Name: Lucy (pseudonym)

The student writer is able to	5	4	3	2	1	Comments
Content and Structure						
Provide relevant background about the topic in the introductory paragraph.	x					Strengths, weaknesses and advice: The essay is clearly organized by point-by-point organization with 3 supporting arguments. Thesis statement should be placed at the end of the 1 st paragraph.
Write a well-formed thesis statement in the introductory paragraph.			x			
Support the thesis with a few major arguments in supported paragraphs in the form of topic sentences.	x					
Use various ways to illustrate and substantiate topic sentences (e.g. with supporting details) .	x					
Compare and contrast ideas by similarity-difference pattern, point-by-point organization or block organization.	x					
Restate the thesis and conclude the argument clearly and strongly – e.g., with a recommendation, a thought, or a comment.	x					
Language						
Use verb tense and forms correctly.		x				The author tried to use advanced vocabulary and sentences, yet occasional errors in word choice, part of speech and sentence structures are found.
Use appropriate words according to the context			x			
Use a range of appropriate words to compare lives in different contexts and discuss your preferences.	x					
Use comparison and contrast structure words to discuss similarities and differences appropriately.			x			
General comments: This essay is logically structured with the thesis clearly stated; however, language quality can be improved. When learning a new word or looking up words in dictionaries, you are suggested to pay more attention to its collocation and English explanation rather than just focusing on the Chinese translation.						

Due to the high cost of housing which occupies a great part of their salary, an increasing number of American selected (tense) to move to the second-tier cities, where welcomed many domestic newcomers (choice of words). Individuals could afford the house rent or else purchase a house they yearn for in It raises a thought (choice of words) that college graduates should determine to the first-tier or second-tier from the salary level and pressure, resources' advantages, and life style.

From my perspective, I have (choice of words) a view that living in first-tier cities is more suitable for graduates. **First of all**, the majority of them are full of power and passion so they are willing to sustain (choice of words) the pressure. The average salary in first-tier cities is high, nevertheless, (sentence structure) the expenditure is also expensive. So they suffer more from the living pressure, of which house pressure is the most prominent; on the other hand, in the second-tier cities, graduates needn't confront too high the house price and other expenditures, but it makes them lack passion for struggle.

Second, first-tier cities have more resources than second-tier cities. Living in first-tier cities has merits (**collocation**) in more job positions, education, recreation like concerts, expositions. While second-tier cities offer less job opportunities to employees because there is little demand for employers. And their lower income limits the economical consumption (choice of words) and entertainment consumption (choice of words); therefore, second-tier cities don't own (choice of words) **large-scaled** concerts and expositions.

Finally, graduates would like to experience a fast-pace life. The first-tier cities are bustle and have rapid pace in order to adapt to intensively compete (**collocation**). Graduates who are brimming with confidence and ambitiousness are willing to accept. Unlike the second-tier cities which are quiet to people, especially the old, who like to enjoy the slow-pace life.

In conclusion, I deem that living in the first-tier cities is more advantaged for college graduates on the ground that the first-tier cities that give them more beneficial conditions to fulfill their dreams.

College EFL Students' Perceptions Towards the Online English Assessment

Hao Li (李浩); Penglin Xie (谢朋霖)

Abstract

English assessments have shifted from paper-based to online during COVID-19. Many teachers and students were not well prepared for the change and were forced to quickly adapt to it. The transform of the assessment approach may bring both benefits and downsides to EFL learners. However, online assessment is much more convenient than paper-based assessment because its AI supported autonomous scoring system. It particularly makes the formative assessment more accessible. In the post-pandemic era, online English assessment might possibly be continued. To better understand the students' needs and improve the online English assessment, this study recruits 83 college EFL students in China using the quantitative method to investigate their attitudes towards online English assessment. The participating college adopts a software called *Chaoxing* as the assessment platform. The results show students' perceptions from four dimensions: cognitive and affective aspects; issues during the exam; gauge of question types; feedback. I found that most students did not have a preference to an online English test and their comfort levels with both online and offline tests were almost the same. They thought the online tests are more efficient and did not worry about technical issues. They were neutral about getting the grades instantly and individualized feedback from teachers.

Keywords: online English assessment; college EFL learners; perceptions; COVID-19; post-pandemic

1. Introduction

Many English assessments moved online around the world because of the pandemic crisis (Abduh, 2021). However, scholars and educators already attached great importance to online EFL assessment before COVID. In 2011, Brink and Lautenbach (2011) stated that higher education institutions around the world recognized the significance of online assessment. The online assessment software might also be appropriate to be continued in use in the post-pandemic era, because of its great convenience brought by its AI-supported scoring system, for example, to reduce marking loads and increase the chances of formative assessment (Özden, 2005). And there are other benefits, for instance, to support the administrative efficiency and to prompt instant feedback to students and teachers (Bull & McKenna, 2001; Özden, 2005).

During the winter of 2022, China experienced a large-scale outbreak of COVID-19. Universities were suspended or moved from offline to online. Many universities adopted online assessment approach for the final exam for the 2022-2023 winter semester, for example, Chaoxing. The participating college in this study used this software to support their 2022-2023 semester 1 EFL summative assessment.

This study conducted a quantitative study of Chaoxing, an online learning and assessment platform. The primary purpose of this study is to investigate college EFL learners' perceptions of online English assessment. Through exploring those learners' attitudes of this online assessment platform, students' needs for the assessment software can be analyzed and suggestions can be generated to improve online assessment software.

2. Literature Review

2.1 Student's perceptions of Online EFL Assessment

There are studies about students' perceptions of online EFL assessment. Özden (2005) conducted a quantitative descriptive study about students' views of online EFL assessment and found that college students generally recognized the effectiveness of e-assessment. The participants acknowledged "the instant feedback, random question order, item analysis of the questions, and obtaining the scores immediately after the exam" are prominent characteristics of online assessment (Özden, 2005, 89). Students in this study reported that the immediate feedback and

scores motivated them to and exert a positive influence on their exam achievement. Özden (2005) also reported that students found that “the comfort, speed, simplicity of editing and alterations, effective measure of learning outcomes, and reduced anxiety” valuable features of e-assessment.

Fageeh (2015) explored EFL students and teachers’ attitudes towards the use of online assessment. The study used a descriptive method, which adopted quantitative data collection and analyses from 400 students and 25 teachers. This study showed that students’ attitudes towards e-assessment are produced by their perceptions of “self-efficacy, enjoyment, usefulness, behavioural intentions to use web-based assessment, system satisfaction and system challenges” (Fageeh, 2015, 41). This study also indicated that online assessment students recognized that e-assessment offered them with instant feedback and automated scores, helping them to have more control over their work and their effort, which aligns with the findings in the study by Özden (2005). The findings in the study by Fageeh (2015, 41) suggested that cultivating online “assessment technology awareness, motivation, and changing faculty and learners’ behaviors and attitudes” is necessary for the success of e-assessment implementation. Sabila et. al. (2020) found out most students would prefer to be evaluated through Edmodo, an online assessment platform, instead of the traditional test or paper-based test.

2.2 Advantages and Challenges of Online EFL Assessment

Advantages of e-assessment are reported by many scholars (Bull & McKenna, 2001; Özden, 2005), for example, increased assessment frequency, boosted students’ learning motivation, broadened assessed knowledge range, increased feedback to both teachers and students, extended assessment method range, increased objectivity and consistency, reduced marking load, and improved administrative efficiency.

Another major advantage is that e-assessment makes formative assessment more accessible. Assessment is commonly divided into the summative assessment and the formative assessment. Summative assessment occurs at the end of a learning process, while formative assessment can occur along with the learning process at any point and is continuous (Abduh, 2021). Meyen et al. (2002) claimed that distance education assessment should be continuous to ensure satisfying learning achievement and thus formative assessment might be appropriate in this scenario. At the same time, integrated AI-supported scoring system in the online assessment platform makes the formative assessment more accessible and convenient considering the decrease of marking load, timely feedback, and the easy accessibility of e-assessment, which can make the assessment more continuous and make it easier to monitor the students’ ongoing learning process (Zhai & Nehm, 2023).

In spite of the perceived advantages of e-assessment, many studies showed challenging issues of it, for example, little or no contact with the instructors, assessment system navigation difficulties, inappropriate automatically generated feedback, insufficient effective interaction, and lack of tech-experience (Abduh, 2021; Holmes and Gardner, 2006). Al-Nuaim (2012) reported challenges consisting of students’ identities identification difficulties. Cheating issues in e-assessment are reported in some studies (Abduh, 2021; Watson & Sottile, 2010; Yilmaz, 2017).

Overall, previous studies show that most students are positive about online EFL assessment. E-assessment can make the test available anywhere anytime as long as there are stable internet connection and appropriate devices. In addition, with the support of AI technology, many computer-assisted assessments are equipped with the automatic scoring system, which makes the feedback more instant and relieves teachers’ working load. Therefore, adopting online assessment in the post-pandemic era might continue to bring benefits for both teachers and students. However, studies about students’ perceptions of online assessment in Chinese contexts are in the shortfall. This study intends to narrow the gap.

3. Research Questions

Through reviewing literature, this research aims to address four research questions:

1. What are students’ attitudes towards the online assessment (cognitively and affectively)?
2. What are the issues during the online exam according to the students?

3. What are students' perceptions towards different question types?
4. What are the students' views of the online assessment feedback?

4. Materials and Methods

The study recruits 83 college EFL students in China to participate in an online questionnaire following Likert scale survey method. The Likert five-point scale items are from strongly agree, agree, neutral, disagree, to strongly disagree. The online assessment platform *Chaoxing* is adopted in this study.

Table 1
Demographic Characteristics of Participants

	N	%
Sex		
Male	43	51.81%
Female	40	48.19%
Age		
17	1	1.20%
18	41	49.40%
19	29	34.94%
20	12	14.46%

4.1 Participants

Participants were freshman students in three schools of a college in China. All the participants were informed about the research, and were informed that they can withdraw from the research at any time without any reasons or consequences. The questionnaire is anonymous. 83 students agreed to take the survey and their demographic features are shown in Table 1.

4.2 Reliability

Table 2
Cronbach's alpha coefficient

N of Items	Sample Size	Cronbach's α coefficient
30	83	0.840

Cronbach's α coefficient was calculated for the results of this study, which is 0.840, higher than 0.8, suggesting that this study results are relatively reliable (Eisinga et al., 2013).

4.3 Data Collection and Analysis

The surveys were conducted right after the online EFL exam to obtain instant responses from the students. The SPSS software was used to analyze the collected data.

5. Results

5.1 RQ 1: What are students' attitudes towards the online assessment (cognitively and affectively)?

Table 3

What are students' attitudes towards the online assessment (cognitively and affectively)?	Sample			
	Mean	SD	Median	Size
I understand the need for online assessments.	4.072	0.908	4.000	83

What are students' attitudes towards the

online assessment (cognitively and affectively)?	Sample	Mean	SD	Median
	Size			
I am more comfortable with paper-based English assessments.	83	3.373	0.744	3.000
I am more comfortable with online English assessments.	83	3.373	0.851	3.000
Online English assessments made me nervous.	83	2.783	0.925	3.000
I prefer online English assessment than paper-based English test.	83	3.325	0.828	3.000

As shown in table 1, cognitively, students understood the need for the e-assessment during the pandemic crisis, with the mean of 4.072. Affectively, students' comfort levels of online and offline assessment were relatively the same, with the means both at 3.373. Students tended to disagree that online assessment made them nervous, with the mean at 2.783. And 54.22% of the students found their attitude neutral when it came to their preference for online or offline assessment, with the mean at 3.325.

5.2 RQ 2: What are the issues during the online exam according to the students?

Table 4

What are the issues during the online exam according to the students?	Sample	Mean	SD	Median
	Size			
Online English assessment is less time-consuming than paper-based test.	83	3.434	0.872	4.000
Online English assessment is more time-consuming than paper-based test.	83	2.627	0.920	3.000
I am worried about unreliable technology infrastructure.	83	3.024	1.047	3.000
I am worried about unstable internet connection.	83	3.120	1.120	3.000
I felt I was ill equipped to handle technology used in online assessments.	83	2.819	1.002	3.000
Teachers were not proficient with online assessment techniques.	83	2.518	0.929	3.000
I would want to be able to go back to check previously answered questions.	83	3.855	0.767	4.000
Being able to annotate questions and make side notes during the online English test would be important to me.	83	3.795	0.808	4.000
I think cheating increased in the online English assessment than in the paper-based test.	83	3.120	0.993	3.000
I think cheating reduced in the online English assessment than in the paper-based test.	83	2.904	0.905	3.000

As shown in table 2, students tended to think that online assessment is less time consuming than paper-based assessment. Most students did not worry about the technology infrastructure, with 45.78% students neutral about the statement "I am worried about unreliable technology

infrastructure.”, and 20.48% of the participants disagreed. Some students worried about the internet connection, with 26.51% of the students chose to agree with the statement “I am worried about unstable internet connection”, but students took the neutral stand took the largest proportion of 36.14%. Students and teachers’ technological skills was not concern for the participants, with the means of 2.819 and 2.518 respectively. Students held the view that being able to go back to check previously answered questions and annotate questions and make side notes during the online English test are important, with the means of 3.855 and 3,795 respectively and the medians both at 4.000. According to the results of the last two questions in this RQ, students perceived that cheating increased in an online assessment.

5.3 RQ 3: What are students’ perceptions towards different question types?

Table 5

What are students’ perceptions towards different question types?	Sample Size	Mean	SD	Median
I find it difficult to answer multiple choice questions in the online English exam.	83	2.976	0.826	3.000
I find it difficult to answer reading comprehension questions in the online English exam.	83	3.590	0.898	3.000
I find it difficult to answer translation questions in the online English exam.	83	3.084	0.829	3.000
I find it difficult to answer writing questions in the online English exam.	83	3.289	0.918	3.000
I wish there can be spoken English test in the online English assessment.	83	2.807	1.018	3.000
I wish there can be English listening test in the online English assessment.	83	2.867	0.934	3.000
I prefer a variety of question styles rather than only multiple-choice questions in the online English assessment.	83	2.651	0.903	3.000

Students found it the most difficult to answer reading comprehension questions in this online assessment, with the mean of 3.590, and they found it the easiest to answer multiple choice questions in this e-test, with the mean of 2.976, while translation and writing tasks were neither difficult or easy. They did not wish to add speaking and listening tests in the e-assessment. And they preferred a less variety of question styles.

5.4 RQ 4: What are the students’ views of the online assessment feedback?

Table 6

What are the students’ views of the online assessment feedback?	Sample Size	Mean	SD	Median
I prefer finding out grades instantly.	83	3.470	0.874	3.000
Online English assessment cannot guarantee getting grades instantly.	83	3.217	0.797	3.000
I wish I can get individualized feedback on assessments from instructors in the online English assessment.	83	3.386	0.641	3.000

Most students were neutral about whether to get grades instantly, with a percentage of 49.4%, while 14.46% of the students strongly wished to get grades immediately after the exam and 27.71%

of them agreed with this question. Students found that online assessment could not ensure immediate grades, with 61.45% of the participants were neutral about this question, 20.48% agreed with, and 7.23% strongly agreed with. As for whether students wished to get individualized feedback from instructors, 62.65% of them were neutral about this question, 28.92% agreed with, 6.02% disagreed with.

6. Discussion

The primary purpose of this study is to investigate college EFL learners' perceptions of online English assessment. The online exam system Chaoxing was used for the summative assessment of and 2022-2023 semester 1 EFL course at a college.

As for students' attitudes towards online EFL assessment, descriptive analysis of the questionnaire data showed that students were neutral about the online assessment. Their comfort levels of both online and offline tests were relatively the same and they did not have a preference to the e-assessment. However, they understood the need for the online test during the pandemic crisis. These findings are different from previous studies which showed that students were positive about the e-assessment (Fageeh, 2015; Özden, 2005; Sabila et. al., 2020). The reason is probably some students were tired of the online learning and assessment during COVID and wished to go back to campus. Therefore, further investigation is required.

As for issues during e-assessment, some prominent results from this research are as following. First, students tended to not worry about the technical issues during the e-assessment, for example, technology infrastructure and internet connection, and they also tended to not concern about teachers and students' technical skills, which is different from previous studies (Abduh, 2021; Holmes and Gardner, 2006), possibly because of technological development today. Second, they considered that cheating problems increased during it, which aligns with previous studies (Abduh, 2021; Watson & Sottile, 2010; Yilmaz, 2017). Third, many of them wished to be able to go back to check previously answered questions and be able to annotate questions and make side notes during the online English test, which needs to be improved in the future e-assessment systems.

For online EFL assessment question types, students found it easy to answer multiple choice questions and difficult to answer reading comprehension questions, which suggests that assessment system navigation or interface needs to be improved to make answering reading comprehension questions more user-friendly (Abduh, 2021; Holmes and Gardner, 2006), and also suggested that students' online EFL reading abilities needed to be enhanced.

For the e-assessment feedback, half of the participants were neutral about whether getting the grades immediately, which is different from previous findings (Fageeh, 2015; Özden, 2005). The study also suggested that online English assessment could not guarantee getting grades instantly, which is different from previous studies (Fageeh, 2015; Özden, 2005), and possibly because the scoring of writing and translation sections could not be solely done by the computer in many cases. This study also indicated that students did not have a strong wish to get individualized feedback on assessments from instructors in the online English assessment, which are also different from previous studies (Fageeh, 2015; Özden, 2005), possibly because of the different participating students' groups.

7. Conclusions

Overall, this study suggested that students held neutral views towards online EFL assessment. Most of them did not recognize technical issues or abilities as problems during the e-assessment. Cheating problems needed to be solved during an e-test. Many of them wished to check previously answered questions and taking notes during e-tests. The interface and navigation of answering reading comprehension needed to be improved. And instant and individualized feedback seemed not very important for the participating students, and the online EFL assessment could not ensure instant grades or feedback.

However, further investigations with a larger group of students and more diverse research methods are needed to testify the findings in this research and exploring ways to improve e-assessment.

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Effects of Chinese EFL students' use of First and Second Language on Peer Feedback of L2 writing

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Abstract

Although peer feedback has long been widely adopted in college English writing classrooms, there is still not enough research done on the issue that which language, L1 or L2, should be used in peer feedback. To advance our knowledge on this issue, we compared the effects of Chinese EFL students' use of L1 and L2 on peer feedback of an English argumentative essay. We randomly assigned two intact classes to two groups in terms of the language they were required to use in peer feedback: the L1 group (i.e., Chinese, N = 18) and the L2 group (i.e., English, N = 20). The two groups provided peer feedback to the same essay based on the same rubrics. We compared the peer feedback of two groups in terms of amount, types, and content of peer feedback. Findings suggested that: 1) the L1 group provided more specific solutions than the L2 group; 2) the L1 group provided more praise and summary feedback than the L2 group; 3) using native language feedback was more helpful for students to understand and absorb questions in the essays. The findings suggested a balanced use of students' L1 and L2 in peer feedback of L2 writing.

Keywords: Peer feedback; L2 writing; L1 feedback and L2 feedback

摘要

尽管同伴反馈在大学英语写作课堂上早已被广泛采用,但对于在同伴反馈中应该使用哪种语言,即一语或者二语,仍然没有足够的研究。为了推进我们对这一问题的认识,我们比较了中国 EFL 学生使用一语和二语对英语议论文同伴反馈的影响。我们将两个完整的班级按照在同伴反馈中所使用的语言的随机分成两组:一语组(即中文, N=18)和二语组(即英语, N=20)。这两个小组根据相同的评分标准对同一篇文章进行了同伴反馈。我们在同伴反馈的数量、类型和内容方面对两组的同伴反馈内容进行了比较。研究表明: 1) 一语组比二语组提供了更多的具体解决方案; 2) 一语组比二语组提供了更多的表扬和总结型反馈; 3) 使用母语反馈更有助于学生理解和吸收文章中的问题。研究表明,在二语写作的同伴反馈过程中,要平衡使用学生的一语和二语。

关键词: 同伴反馈; 二语写作; 一语反馈和二语反馈

Effects of Chinese EFL students' use of First and Second Language on Peer Feedback of L2 writing

1. Introduction

In L2 writing classes, peer feedback is a typical type of cooperative learning. Compared with teacher feedback, peer feedback is becoming more and more popular among teachers and academics because it encourages students to express themselves clearly and to improve their writing while completing the task of peer review. Peer feedback involves two-way, active communication between students and also aids in the growth of a cooperative attitude and independent learning abilities in students (Zhou, 2013). To explore the impact and influence of various feedback modalities on the peer feedback process and subsequent revisions, researchers today use a number of different mediums in their peer feedback studies. The importance of language as a significant facilitator of peer feedback is, however, hardly recognized by studies (Yu & Lee, 2014). For Chinese students in an EFL environment, language plays an important role in the peer feedback process. Compared to native speakers, EFL learners have at least two languages to use when participating in peer assessment. L1, the native language, is an important tool to make sense of the text, and the use of the native language enables students to organize their language easily and express their opinions and ideas clearly. In contrast, the question of whether L2, English, should be used in peer feedback has always been a concern to researchers. With this in mind, we experimentally study the effects of using different languages in L2 writing peer review by Chinese EFL students on the content of the feedback. This study designed a round of comparative survey study of L2 writing peer feedback in which two classes were randomly divided into two groups and peer feedback was given on the same

essay using the same set of criteria but in different languages, with the goal of exploring the differences between L1 and L2 in peer feedback of L2 writing.

2.Literature Review

In L2 writing classrooms, engaging students in peer review is a common "learning activity and source of information" (Kim&Chang, 2020)that promotes communication and collaboration among students to improve their writing. It has been shown that peer review has a significant impact on the development of Chinese students' L2 writing skills, and that it contributes to the improvement of Chinese EFL students' L2 writing construction skills (Deng&Cen, 2010). Many scholars have studied L2 writing at different levels. For example, some scholars have argued that in addition to the contribution of language factors in L2 writing instruction, the positive role of discursive skills in L2 writing should be emphasized(Gao&Wen, 2017). Other scholars have conducted a quantitative analysis of native language use in the L2 writing process, and the results showed that L1 is widely used in the L2 writing process and that the amount of L1 use in language use is negatively correlated with overall ratings(Chen&Wang, 2010). Language is one of the extremely important foci of research on L2 writing and peer review of writing, and advocates of L2-only learning policies argued that the amount of exposure to the target language has a positive impact on learners' L2 development and that excessive use of L1 could deprive students of opportunities to use the language they were learning(Ellis,1984). Storch& Wigglesworth(2003) have also conducted empirical studies to investigate students' attitudes toward the use of L1 in L2 classrooms, and the findings revealed that students agree that using their native tongue speeds up work completion. All of the above studies show that the use of L2 is difficult to avoid in the process of L2

learning and writing, and likewise, the use of the L1 is often observed in L2 writing peer review group tasks (Yu & Lee, 2014). However, the topic of how the use of different languages affects the content of feedback has rarely been explored in writing peer review tasks. Based on the research backdrop described above, this study used quantitative analysis to answer the following two research questions about the effects of using L1 and L2 feedback on feedback content.

Research question

This study focuses on answering the following two questions:

1. What is the effect of using L1 and L2 on the content of feedback during peer feedback?
2. What are the differences between L1 and L2 feedback? What are the reasons?

3. Methods

3.1 Research context and participants

This study was conducted in an English major's writing class at a key university in Beijing. This course is a compulsory course for third-year English majors, and the language of instruction is English, but students are still free to use their native language. A total of 38 students from two classes participated in this study. The course consisted of 16 class hours, two class hours per week, and a total of six writing assignments. Prior to this study, the students had received training on peer feedback and had completed several rounds of peer feedback tasks, so they were very familiar with the entire process of peer review. Based on this, the study was organized as follows: 1) The two intact classes were randomly divided into two groups according to the language used in the peer feedback: the L1 group (i.e., Chinese, N=18) and the L2 group (i.e., English, N=20). 2) Except for the language used, both groups used the

same evaluation criteria and reviewed the same articles.

3.2 Data collection and data analysis

The primary data for this study came from a total of 409 peer review comments provided by 38 students from both groups. We also assured the students before the start of this study that the comments they provided would be used for academic research only and would not reveal the students' personal information. All participants agreed to participate in this study.

Data analysis consisted of 1) comments segmentation provided by peer feedback and 2) coding and summary. The segmentation of the comments was done by the first researcher and checked by a postdoctoral faculty member who is deeply involved in the field of writing peer review. After all the comments were split, a total of 699 valid comments were obtained, with each comment identifying a problem that arose in the writing. Data coding was done cooperatively by two researchers once the data had been segmented. The comments were coded and examined by the researchers across a total of seven dimensions. First, we categorized the comments into critical and non-critical feedback to determine the type of comment. Second, in order to further investigate how the use of L1 and L2 affected the content of the feedback, we separated and classified the comments based on whether they explained the issues that had arisen in the essay and whether they provided general suggestions or particular solutions. Finally the researchers also coded two dimensions, whether the comment was about content criticism or language criticism, for a total of seven dimensions. The two researchers first coded the data individually according to the selected dimensions, and any divergent parts of the coding were flagged, followed by multiple rounds of discussion and help from senior researchers until all data were coded in a uniform

manner.

Based on the coding scheme, the researchers calculated the frequency of occurrence of all L1 and L2 comments in different dimensions and performed independent samples t-tests using SPSS to determine their significance.

4.Results

To investigate the effect of using L1 and L2 on the content of feedback, the researcher combined the data from both classes on one table using pivot tables after coding all the comments evaluated in the Chinese and English according to the selected dimensions. The researcher employed language diversity as dependent variables and seven dimensions, i.e., critical feedback, non-critical feedback, explanations, broad suggestions, specific solutions, content criticism, and language criticism as dependent variables, the number of comments was also taken into account, and then conducted an independent samples t-test, the results of which are presented in Table 1.

Table 1 shows that there is a significant difference in providing non-critical feedback and specific solutions when using L1 and L2 for feedback.

Table 1 Effects of the use of L1 and L2 on the contents of feedback

Dimensions	Significance
Critical feedback	.471
Non-critical feedback	.017
Explanations	.093
Suggestions	.079
Solutions	.020
Content criticism	.374

Language criticism	.501
Number of comments	.990

5. Discussion and conclusion

5.1 Effect of using L1 and L2 on the content of feedback

This study has addressed whether there is a substantial variation on the the effect of using L1 and L2 on the content of feedback. It was found that there are significant differences in the use of the two languages in providing non-critical feedback, i.e., summary and praise feedback, and in suggesting specific solutions to problems that arose in the essay, across all seven dimensions of comparison. That is, feedback in the native language is more conducive to students expressing and dealing with questions related to the specific content of the essay, and then suggesting specific solutions, such as adding examples or complete background information, etc. The detailed solutions provided by the reviewer to the problems of the article are also more useful for the author to make targeted changes to the article, thus further improving the student's writing.

In addition, we found that when feedback was given in Chinese, the reviewers provided more praise and summary comments on the essays, which is something that is not done as well in L2. In the process of reviewing essays, it is just as important to identify and raise problems in the essay as it is to summarize and praise the good parts of the essay. A student who has the ability to summarize the good essays and reflect it in the feedback is also more outstanding and excellent in his feedback. Both classes participating in this study had experienced prior training in peer review as well as actual practice, so it is safe to say that their previous evaluation levels would not have

differed much, but using the native language made it easier for students to enrich their comments, not just by pointing out errors, but by judging an essay from a more comprehensive perspective. According to certain research, authors who receive positive feedback are better able to manage their emotions during the feedback process and the subsequent essay revision than if they only receive critical feedback. This also demonstrates that the use of comments in L1 provides authors with more comprehensive and positive feedback, which is beneficial for subsequent revisions.

5.2 Differences between L1 and L2 feedback

In conjunction with the results of this study, feedback on peers' essays using L1 or L2 differed only in two dimensions, with no significant differences in the other dimensions, including the number of comments. It is possible that the reason for such a result is that the students are already very familiar with the ways and means of peer feedback, and the language used does not hinder the feedback process. As long as they have an opinion about the essay, they can express it as they wish, but with the universality of intelligent learning tools, the researchers do not rule out the possibility that some students may use machine translate and other ways to simplify their feedback tasks, and this would have a certain degree of influence on the researcher's judgment. In addition, when it comes to the differences between L1 and L2 feedback, the researchers found that the students' comments were more organized when they were written in the second language than in their native language. Specifically, the comments written in English had a complete framework, and the students mostly used first, second, and third words to organize their language. This is also the difference between using different languages for feedback. Using the native language helps students to master the language better. Although the native language comments are

not as well-organized as the English comments, the students' written comments show that they write spontaneously and provide direct, precise information without having to stop and consider switching languages.

5.3 Conclusion

Whether the use of L1 and L2 for peer review in English writing classrooms makes a difference in the content of feedback is one of the questions that many second language researchers have. Along with the overall study, the utilization of the writers' native tongue for comments aided in providing them with praise evaluations and detailed suggestions and the different ways of thinking and organizing language using the two languages contribute to this result. Peer review is a joint instructional activity between reviewer and author, and we need to consider the concerns and needs of both parties when exploring the use of different languages to complete peer reviews. Although the students in the peer review class were English majors, using more L2 would help their learning to a certain extent, but in the writing class, the use of peer review is a teaching tool that assists students to better improve their writing, the primary goals of the writing class are to teach students practical writing tasks and writing techniques. A very significant factor that the instructor needs to take into account when planning the lesson is whether utilizing a language that the students are not that familiar with will place additional load on the students. As the results show, the use of L2 for peer review in this study did not create a tremendously significant effect on the content of the feedback in all dimensions, and it was also beneficial for the EFL students to use more L2 to practice their own multifaceted writing skills. For this reason, when teachers set up peer feedback activities, the unrestricted use of language is more conducive to the personal development of the students. The study

results also advised a balanced use of students' L1 and L2 in English writing peer feedback. Therefore, throughout multiple rounds of peer feedback sessions, a specific quantity of L2 feedback is set up to enhance language proficiency and feedback literacy.

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The Development of English Learners' Intercultural Competence Through a Telecollaborative Program

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Abstract: Fostering the development of intercultural competence (IC) is one way to equip our students with the linguistic and cultural skills to communicate effectively with people from diverse backgrounds, particularly English majors who are most likely to encounter multicultural work environments in the future. The purpose of this study is to compare the English majors' intercultural competence in terms of three fundamental levels: affective, cognitive, and behavioral before and after a ten-week telecollaboration program between 23 English majors at a Chinese university and 23 American students enrolled in a Chinese class at an American university, and analyze their development during the program. A combination of quantitative and qualitative research methods was used in this study, such as questionnaires, classroom observations, semi-structured interviews, and students' weekly journals. The results indicate that subjects' intercultural competence improved significantly over time and telecollaboration aided participants in enhancing their interest, curiosity, and intrinsic motivation in intercultural communication. With the widespread use of the internet, this type of online cultural exchange has a promising future, as suggested by the findings of the current study.

Key words: English Major, Intercultural Competence, Telecollaboration

Introduction

In an increasingly interconnected world, developing intercultural competence (IC) is important not just for preparing students for the global job, but also for fostering a peaceful international society in which individuals from all backgrounds communicate respectfully. However, research indicates that many adult students lack adequate intercultural knowledge, attitudes, or abilities. (e.g., Bai, 2016; Cushner, 2015; Peng, Wu, & Fan, 2015; Yarosh, Lukic, & Santibáñez-Gruber, 2018). A lack of IC leads to prejudice, discrimination and unfriendly speech, which are directly related to misunderstandings among people of different cultural backgrounds and affiliations (Barrett, 2011). The possible negative repercussions of a lack of IC have piqued the interest of academics and educators in learning how to enhance IC. Against this background, various approaches have been used to enhance IC among people with different identities and roles, such as intercultural training (Santerini, 2010), international travel (Santoro, 2014), professional development courses (DeJaeghere & Cao, 2009; Teräs & Lasonen, 2013), study abroad programs (Kasmer & Billings, 2017), culturally diverse group projects (Arshavskay, 2018; Brendel, Aksit, Aksit, & Schrüfer, 2016; Jin, 2015) and computer mediated communications (Chen & Yang, 2016). Among these approaches, telecollaboration has been a popular, cost-effective way for most students who stayed at school to develop IC.

Previous Research

There has been an increase in interest in studying IC in higher education over the past few decades in an effort to aid students' intercultural growth (e.g., Buchtel, 2014; Wang & Kulich, 2015). Actually, researchers have used a variety of terminology that

are analogous to intercultural competence (IC), including multicultural competence, global citizenship, transnational competence, cross-cultural skills, intercultural communication competence, and cultural intelligence (Fantini, 2009). Although there are subtle distinctions between these phrases, they all refer to the same core concept: how people perform in cross-cultural situations. The core concept that all of these concepts share is undoubtedly the emphasis on “interculturality,” or what happens when cultures interact. This paper utilizes intercultural competence in this study as an all-encompassing term for the aforementioned concepts.

Over the last several decades, researchers have developed a great many definitions and frameworks to describe IC analytically. Although there are differences in the definition of intercultural competence, in recent years, scholars have made more systematic analysis and interpretation of intercultural competence from different perspectives and formed a basically consistent understanding that intercultural competence is an individual’s ability to perform communicative activities effectively and appropriately in a given cross-cultural context (e.g., Byram, 1997; Deardorff, 2004; Wu Weiping, 2015). As for the components of intercultural competence, there is a consensus that it encompasses three fundamental levels: affective, cognitive, and behavioral, so this paper refers to Chen and Starosta’s triangle model of ICC including the cognitive aspect—intercultural awareness, the affective aspect—intercultural sensitivity, and the behavioral aspect—intercultural effectiveness.

According to previous research, telecollaboration fosters intercultural knowledge with regard to cultural products, practices, and perspectives as well as perceived knowledge of the target culture, much like the benefits of studying abroad (Bohinski & Leventhal, 2015; Lee & Markey, 2014; Schenker, 2012). Participants reported that after learning more about the target culture, they changed any unfavorable assumptions they had about it (Bohinski & Leventhal, 2015; Kirschner, 2015; Itakura, 2004). However, it should be highlighted that telecollaboration could result in or reinforce unfavorable preconceptions of the target culture if cultural confrontations happen between speakers of various cultures without the teachers’ guidance (Belz, 2002). Studies on the aspect of attitude and awareness have also produced a mixed bag of results. According to certain studies (Chen & Yang, 2016), telecollaboration aided participants in enhancing their interest, curiosity, and intrinsic motivation. Other studies (Schenker, 2012) found that students’ interest in or respect for the target culture had barely changed. However, no literature that specifically examines the component of skills is found.

Methodology

This study included 23 freshman English majors from a normal university in China, with an average age of 19. All of them volunteered to participate the ten-week telecollaboration program, which was the context of the study. The program was attended by 23 English majors from the Chinese university and the same number of Chinese majors from the U.S. The 23 students on both teams were randomly divided into five groups, with five students in four groups and three students in the fifth. The duration of the curriculum was ten weeks in total. Table 1 lists the primary contents of the telecollaboration program, which utilized videoconference, WeChat, and email as its primary online communication methods. Teachers and students from the two countries used English as the lingua franca during the videoconference. In addition to this fixed-time online real-time video communication, the Chinese students were supposed to communicate with their partners at least twice per week via WeChat, committing to one hour of talk in English per week. In addition, the Chinese and American students exchanged emails throughout the fifth week. Three teachers,

majoring in comparative studies of Chinese and Western cultures, served as facilitators on our Chinese side of the telecollaboration project, providing students with discussion topics, assessing their engagement with the project via weekly journal entries and oral presentations, and constantly monitoring their interactions to ensure regular group meetings.

TABLE 1
PROCEDURES FOR THE TELECOLLABORATION PROGRAM

Timeline	Telecollaboration (Spring 2022)
Preparation	Pre-questionnaire
Week 1	Self-introduction & Food differences
Week 2	Free topic & Video conference
Week 3	Virtual tour & Weekly journal
Week 4	Free topic & Video conference
Week 5	Email exchange (Virtual tour to the U.S or China) & Weekly journal
Week 6	Free topic & Video conference
Week 7	Campus life & Weekly journal
Week 8	Free topic & Video conference
Week 9	My major & Weekly journal
Week 10	Oral presentation
Wrap up	Post-questionnaire

Deardorff concluded that the optimal approach to evaluating IC is a combination of quantitative and qualitative methods. Although qualitative approaches permit a more extended representation of intercultural competence, quantitative assessment methods such as questionnaires may not accurately and completely reflect students' actual performance in intercultural circumstances. To evaluate the intercultural competency of English majors, this study used mixed research methods.

Using a five-point Likert scale, we constructed a 48-item questionnaire to evaluate the cognitive, affective, and behavioral elements of IC (1 = strongly disagree, 5 = strongly agree). For the cognitive domain, we adopted four questions ($\alpha = .79$) from Juhee Lee's 2019 study that focused on particular knowledge of cultural products, behaviors, and attitudes, as well as the capacity to comprehend cross-cultural distinctions. As for the remaining two characteristics, we utilized the Intercultural Sensitivity Scale (ISS) ($\alpha = .88$) to assess the intercultural sensitivity of subjects and the Intercultural Effectiveness Scale (IES) ($\alpha = .85$) to assess the intercultural effectiveness of subjects.

During the course of ten weeks, these students engaged in four self-selected discussions and four teacher-assigned assignments. After weekly interactions, all students submitted weekly journal in English or spoke in the video conference, which synthesized their reactions to the discussion topics and their newly acquired knowledge. Those who had difficulty writing in English were permitted to utilize both languages interchangeably. In addition, we determined the frequency of student communication within the telecollaboration group. WeChat's chat history can be downloaded, and the video conference was recorded and transcribed into text using iFLYTEK software, allowing researchers to assess quantitative aspects of students' interactions, such as frequency of contact and quantity of words in written chats. In addition, the email exchange over the virtual tour served as a supplement. Once the programs concluded, semi-structured face-to-face interviews (lasting roughly 30 minutes) were performed in Chinese with three participants of telecollaboration. To analyze the students' participation in the project, their feedback on the exchanges, their relationships with American partners, and challenges they faced during interactions, the researchers collected data through interviews. The interview

questions allowed for a range of responses from the participants. The interviews were recorded in audio format and transcribed for analysis. Finally, it is important to note that we used these data exclusively for research purposes in this study.

Results

All assignments, including IC surveys, weekly journals, email, and oral presentations, were completed during the program. After explaining the project in detail, written informed consent was obtained from the participants. All references that could have been used to identify the individuals were removed or replaced with pseudonyms.

This quantitative data was acquired through a questionnaire survey. The pre-questionnaire is administered in the first class of the course, while the post-questionnaire is administered in the last class. Both the pre- and post-surveys compare questionnaire results using the same two questionnaires. The recovery percentage for questionnaires distributed and collected is 100 percent. Use SPSS 26.0 for descriptive statistics and paired sample T-tests on the quantitative survey data. The qualitative data were collected through weekly journals, emails, chat history from WeChat, transcripts of videoconference and interview. Participating in and recording this process, we focused on observing and documenting the intercultural communication behavior of students via WeChat and videoconferencing. Regarding journal entries, students submitted their program reflection journals every Monday and recorded their primary communication-related actions and emotions. The classification and analysis of students' communication performance and journal entries are predominately based on the ICC model proposed by Chen and Starosta, with a focus on cognitive, affective, and behavioral aspects.

The paired-samples t-tests (Table 2) demonstrated that participants' perceived cognitive, affective and behavioral aspect of IC increased after the telecollaboration program, and the differences between intercultural awareness, sensitivity and effectiveness before and after the program are all significant, which demonstrates that the ten-week telecollaboration program can considerably increase English majors' intercultural competence generally.

TABLE 2
RESULTS OF A PAIRED SAMPLE T-TEST OF STUDENTS' INTERCULTURAL COMPETENCE BEFORE AND AFTER THE PROGRAM

Factors	Investigation	Mean	N	Std. Deviation	t	Sig.
Cognitive-intercultural awareness	pre	10.91	23	1.31		
	post	13.87	23	1.74	-9.705	.000**
Affective- Intercultural Sensitivity	pre	84.96	23	6.86		
	post	88.78	23	6.62	-3.853	.001*
Behavioral-Intercultural effectiveness	pre	59.83	23	5.25		
	post	65.22	23	6.47	-8.719	.000**

Intercultural awareness is the cognitive aspect of intercultural competence, during these ten weeks, Chinese students discussed cultural-related topics, such as diet, sports and festivals with native English speakers, which greatly enriched students' understanding of the target language culture. Susan mentioned the following in her weekly journal on September 13, 2022:

In our last class, through further discussions with foreign friend Tiffany, we are more fully aware of the various differences between Chinese and foreign sports, such as the weekly frequency of physical exercise and sports skills of famous sports at home and abroad. These all give us a full understanding of the different cultural differences and life details.

It is evident from this section of the journal that Susan and the other students have a greater understanding of not only sports differences, but also other life nuances behind sports, all of which constitute product and practice knowledge. In the

semi-structured interview conducted after the program, Winnie expressed similar sentiments regarding the overall appraisal of the exchanges:

We communicated with Mark as scheduled last Friday but that time it was different from the past, he explained many table manners in western country instead of letting us introducing foods in China. What impressed me most was how to use tableware to represent your thoughts of dinner, for example, if you want to still eat you need to put your knife and fork like this and if you wait new dish you need to put your knife and fork like that. It's very interesting.

This girl learned more about table manners from their international partners and she stated that it is intriguing in her journals. Thus, it can be seen that the impact of telecollaboration on intercultural awareness is quite strong as Czerwionka et al. proposed that having knowledge about different cultures could facilitate better intercultural interactions. This is because being aware of cultural norms helps individuals anticipate potential conversation topics and understand the behaviors of their conversation partners in a more nuanced way.

Intercultural sensitivity is the affective aspect of intercultural competence. Frequent interactions also enhanced the students' awareness of the similarities between Chinese and American people, leading them to the idea that all humans are alike in several ways. This realization could also boost the subjects' interactional confidence, corroborating earlier results that regular contact reduces negative emotions, such as anxiety and fear, and increases positive emotions, such as comfort and empathy. As Jane stated in the interview in response to a question regarding the exchange's overall evaluation:

Once I was afraid of talking to Americans, supposing they were unfriendly. After this program, however, I learned that their routines and thoughts are very similar to ours, so now I'd like to express myself in English and even make friends with Americans.

From this section, we could see the realization that they had many similarities promoted Jane to identify with one another and diminished their psychological distance.

Intercultural effectiveness is the behavioral aspect of intercultural competence, which has seen significant increase in the ten-week real-time telecollaborative project with American students, especially in their interaction relaxation. "Interaction Relaxation" refers to the ease at which an interactor feels while conversing, specially referring to their approachability, openness, and overall comfort level during the interaction. The following three factors may contribute to a significant increase in this component throughout the course. First, practical cross-cultural communications broke down certain misconceptions, and the participants' peers' kindness and tolerance helped them relax. The telecollaboration program offered the subjects with authentic opportunity to engage with people from diverse cultural backgrounds in the United States. Observations indicate that at the beginning of the videoconference, the subjects were reluctant to pose questions to their American peers. Some subjects seemed to be very careful in selecting questions and some were even obviously nervous when doing their asking. As Sana described in her journal:

The first problem I faced in the class was I didn't know what to talk in the class and I was not sure whether I could ask them some questions about their ages, jobs, experience, etc.

But, as the program progressed and the subjects engaged in several interactions, they found that their American counterparts were not as proud, indifferent, and

privacy-protective as depicted in the written materials they had previously read. In reality, American students were quite hospitable and tolerant. During the subjects' self-introductions, for instance, the American students listened attentively and even took notes, and this type of behavior touched the subjects. In addition, they tended to be tolerant of the subjects' verbal errors. The individuals' anxiety melted away as a result of this benevolence and tolerance, and they felt more at ease with international conversation. Below are a few examples of student journals:

A. The attitude of the American classmates really surprised me. They took notes of everyone's self-introduction, and tried to find something in common with us. When they asked questions, they asked everyone in their names and about what they had said in their introduction. They showed such great respect on us.

B. Today I had talks with several American students through WeChat and what surprised me most was that they were patient enough to answer my questions as well as to check my grammar mistakes sometimes.

The second reason for the significant change in the participants' "Interaction Relaxation" is the parallels discovered during program contact between the subjects and their culturally diverse American peers. The concepts given and explored in this program were highly relevant to the students' everyday lives. Hence, it was natural for students to share their hobbies, favorites, and personal ideas throughout the presentation and free discussion phases of communication. Then, it was easy for them to discover some shared interests that could strengthen their bond and help them relax. Exactly as described in their journals:

A. During the conversation, we found our common hobbies and talked about that with each other. I was cheerful when we understood each other and shared opinions about the same things we love.

B. I am so surprised that he likes music just the way I do. We love the same singers, the same songs. And we both like watching TV. We share a lot of our hobbies.

Overall, telecollaboration is an effective way to promote intercultural competence among students, and educators should consider incorporating telecollaborative activities into their curricula to enhance students' intercultural learning and understanding.

Implications and Conclusion

Although the advantages of telecollaboration have been demonstrated in this study, and it is recommended that this kind of cross-cultural communication be extensively used, there are also certain limits that must be considered.

This study is founded on one of the earliest telecollaboration trials in China. Because this type of program has not been extensively implemented, this study is limited to a Chinese municipal university with 23 English majors. Due to the distinct semesters in the two nations included in this study, the telecollaboration program which the present study investigated lasted ten weeks. Future studies can conduct more experiments in this type of telecollaboration program, which may involve collaboration between different countries, have more diverse and larger samples, use other types of communication tools, or last for a longer period of time, in order to delve deeper into the potential effects of this type of program on the intercultural competence of participants.

With limited time and resources, this study focused primarily on the impact of the telecollaboration program on the intercultural sensitivity and intercultural effectiveness of the English majors who participated. The impacts of telecollaboration

on other aspects of the intercultural competence of participants were not included. Future research could potentially focus on these characteristics. Moreover, as a result of the rapid development and widespread use of the internet, computers and the internet are accessible in several locations, and the telecollaboration program based on them has a promising future in schools. Further research is required to study the benefits of the telecollaboration program on other fronts, such as the effects of these courses on the participants' language proficiency.

According to Deardorff, when measuring the intercultural communication competence of individuals, many assessments are typically preferable to a single one. This research utilized a combination of questionnaires, observations, interviews, and subject journals, or mixed techniques. With the objective of bolstering the trustworthiness of their research findings, future research should include additional approaches, such as teacher journals.

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The Future of Oral Testing for Chinese as a Foreign Language(CFL): Automated Dynamic Interactive Testing

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Abstract

The term "oral proficiency" in Chinese language testing refers to the ability of Chinese language learners to express themselves orally. The testing content encompasses factors such as pronunciation, grammar, pragmatics, vocabulary, and is also influenced by cultural backgrounds. Chinese oral proficiency tests are typically conducted in two formats: direct oral tests and semi-direct oral tests, each with its own advantages and disadvantages. This thesis aims to explore how the strengths of both testing formats can be integrated using artificial intelligence and speech recognition technology, to create an effective automated dynamic interactive testing approach. This research offers new perspectives for the future of Chinese oral proficiency testing by incorporating features such as simulated human-like conversations, customized topics, the establishment of graded and topic-based corpora, automated interactive processes, and interactive dialogue models. The proposed automated dynamic interactive testing is a futuristic concept for the existing forms of Chinese oral proficiency testing, albeit with certain practical challenges. However, it also presents new opportunities and directions.

Key words: Artificial intelligence, speech recognition, language testing& assessment, oral proficiency, interactive dynamic assessment, CFL

Introduction

In Chinese Language oral tests, "oral" refers to the ability of Chinese language learners to express themselves orally in Chinese. In a narrow sense, oral expression includes verbal communication in learning, daily life, social interactions, meetings, and conversations. In a broader sense, oral expression includes lecturing, public speaking, debating, and commentary (Lv Bingsong, 1992). Therefore, Chinese oral tests encompass various factors such as pronunciation, grammar, pragmatics, vocabulary, and are influenced by cultural backgrounds. The focus of the test is on the ability to express oneself orally. Oral tests mainly assess the following aspects: In terms of the phonetic system, whether the learner's pronunciation and intonation are accurate and whether their expression is fluent. During specific expressions, whether the learner can use words correctly and appropriately, whether their vocabulary is rich, and whether the tone is natural. Whether the learner uses correct grammatical structures, and whether sentence expressions are accurate. In different scenarios and for different communicative purposes, whether the learner can select appropriate and suitable expressions, use different words or sentence structures. Whether the expression is fluent and whether the communicative goals are achieved.

Compared to other skill tests, oral tests are more subjective, making it relatively difficult to design scientific and effective oral tests. The effectiveness of oral tests is influenced by various factors, such as the students' proficiency level, question design, content selection, and the format of the assessment.

Forms of Chinese Oral Proficiency Testing

Firstly, the form of testing has a significant impact on the results. In general, there are two types of oral tests: direct oral tests and semi-direct oral tests. In direct oral tests, the examiner and the student engage in face-to-face conversations in

Chinese. Usually, one student faces one or two Chinese teachers, and the main examiner writes down the questions and answers during the conversation. Once the conversation is complete, the teacher evaluates the student's oral proficiency. In semi-direct oral tests, the entire test process is recorded, and the examiner does not provide immediate scoring. The student's oral proficiency is assessed based on the recorded audio later. Both methods have their advantages and disadvantages:

	Direct Oral Test	Semi-Direct Oral Test
Examiner	Human	Computer
Scoring:	Human	Human
Advantages:	<ul style="list-style-type: none"> • Authenticity: Face-to-face interaction between people is closer to real-life Chinese oral communication. • Observability: Teachers can observe non-verbal cues from students during the conversation. • Timeliness of scoring: Teachers can score immediately during the test. 	<ul style="list-style-type: none"> • High standardization and convenience: Enables rapid and large-scale completion of the oral test process. • High scoring accuracy: After saving the recording, teachers can listen to it repeatedly, allowing more time for accurate scoring.
Disadvantages:	<ul style="list-style-type: none"> • Subjectivity: Teachers may give sympathetic scores or encourage students when they are nervous or experiencing speech difficulties. The examiner's emotions and 	<ul style="list-style-type: none"> • Lack of authenticity: Test takers may find it difficult to express themselves naturally when facing a machine, perceiving it as rigid and mechanical.

	<p>attitudes can directly affect the student's performance.</p> <ul style="list-style-type: none"> • Time and effort-consuming: Organizing, invigilating, and scoring various aspects of the test can result in a waste of human resources. 	<ul style="list-style-type: none"> • Delayed scoring: Examiners need extra time and effort for scoring, which is not as fast as immediate scoring.
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Table 1: Comparison of Testing Forms

Direct and semi-direct oral tests have similar question types, but in direct oral tests, the teacher engages in dialogue with the student (although some tests, such as the IBDP oral test, involve one-way oral interaction), simulating real-life language scenarios and offering more interaction than semi-direct tests.

Direct and semi-direct oral tests are similar in terms of question types, but in direct tests, teachers engage in conversations with students (although some tests, such as the IBDP oral test, involve one-way oral interaction), simulating real language scenarios and being more interactive than semi-direct tests. In semi-direct tests, students speak to a machine, which can make their speech sound rigid and unnatural. Since oral proficiency needs to assess students' communicative abilities, the interview method, i.e., direct oral tests, has long been used as the traditional and familiar approach for both students and teachers. However, the advantages of semi-direct tests should not be overlooked. So, would it be more economical and effective to combine both approaches, incorporating the strengths of each while compensating for their shortcomings? In other words, by fully utilizing modern AI intelligence and speech recognition technology, a more realistic communicative scenario can be created,

reducing the boredom and mechanical feeling of interacting with computers. This new approach ensures the objectivity of scoring while also improving the speed of generating scores. Additionally, it enables timely recording of the examination process and prompt feedback of the test results.

New Forms of Chinese Oral Tests

Our era has gradually transitioned from the Internet era to the Internet of Things era, and conversational interaction has the potential to become a mode of interpersonal interaction in the Internet of Things era. In fact, people are already interacting with various devices, even those without screens, such as smart speakers like Xiaoai AI, or devices with screens that are at a distance from humans, such as televisions or screens that are not easily visible to individuals, such as car central control screens or rear view mirrors. These devices can now be operated and controlled through voice recognition. From Siri on our smartphones to voice-activated assistants like Amazon's Alexa or Google Assistant, speech recognition technology has made significant advancements. This technology has the potential to revolutionize the way Chinese oral tests are conducted.

Creating interactive scenarios with lifelike humanoid figures

First and foremost, in the test, it is important to simulate conversations between humans to avoid mechanization. In the examination, we can allow examinees to choose a lifelike humanoid figure for dialogue in front of the computer (taking reference from the startup company Gowild, which has previously released an "AI Virtual Life" named Amber, a virtual character resembling a young woman). This virtual character should have a name, gender, and age. Alternatively, we can refer to an AI video chat tool called "Call Annie," which is based on ChatGPT. The video

image of Annie is generated using a tool called Midjourney, which produces realistic human face images. Annie's facial expressions and actions appear natural and authentic. Instead of a rigid intelligent voice assistant, Annie is presented as a virtual female with a gentle voice and natural beauty. Thus, the interaction with the virtual character should be a natural and culturally informed conversation, beyond just visual representation.

Secondly, there is the aspect of oral interaction. Oral interaction involves the comprehensive application of various aspects of oral language knowledge, such as pronunciation, vocabulary, grammar, etc., in the process of using spoken language for social communication. It is important to note that oral interaction differs from simple oral expression. The most notable difference between a dialogue involving two or more people and individual speech is that in a dialogue, both parties always expect a response from the listener. In other words, besides the visual representation, we also aim for the interaction with the virtual character to be natural and culturally rich conversation.

Customizing personalized topics

For exam candidates, the performance of oral interaction is not only influenced by the interaction partners but also by factors such as the topic. It does not always reflect their highest level of proficiency. Some topics may be complex for certain individuals but simple for others, which affects the participants' ability to engage in oral interaction. The differences in topics also make it difficult to establish a common basis for horizontal and vertical comparison between oral interactions on different topics, making it challenging to determine whether the performance of oral interaction is influenced by the topic or the ability to interact. Therefore, in the selection of topics

and language materials, it is important to focus on everyday communicative needs and choose high-frequency topics derived from real-life situations. Additionally, allowing candidates to choose a topic of their interest and familiarity can stimulate their desire to **express** themselves. Following that, a random topic can be selected for interactive discussion. Finally, a comprehensive evaluation can be conducted to achieve maximum objectivity while also incorporating a certain level of personalization.

Building an automated interactive process

The process of human-machine question-and-answer is achieved through the automation of speech dialogue systems: first, the front-end speech recognition module is used for speech recognition, then it enters the spoken language understanding module, and the data is output to the dialogue management module to determine what kind of response should be generated and how to generate it in natural language. Finally, it is played back using speech synthesis methods. Excluding the final step of speech synthesis, we can observe that the core of this process lies in the understanding (decoding) of semantics and the current context, as well as the generation (encoding) of natural language. Therefore, we can construct this interactive framework centered around topics, establish dynamic language databases divided by scenes and topics, and include corresponding vocabulary, sentence patterns, conversational turns, and even pragmatic contexts that would realistically occur under these topics. During testing, the machine can seamlessly connect based on the context (i.e., the machine's questions and the candidate's responses). For example, in the topic of "hobbies," if the computer asks, "What is your hobby?" and the candidate answers, "I enjoy hiking," the computer will continue to have the further conversation based on the candidate's response, such as asking, "How often do you go hiking?" This initiates a new round of questioning and answering, creating a smooth conversation experience. At the same

time, the computer can collect external environmental information through a central control system and incorporate the candidate's emotions and expressions, such as nervousness, anxiety, excitement, or gestures, to provide timely encouragement and relaxation as feedback. This enhances the human-like nature of the machine and improves the sense of realism.

Creating a dialogue exam mode between candidates

Indeed, this automated testing not only manifests in the machine's automated responses to candidates but can also involve dynamic testing modes where candidates with the same topic engage in live dialogue. In traditional examination methods, candidates are often passive respondents, which can lead to feelings of nervousness and difficulty fully demonstrating their interactive abilities. Moreover, candidates and examiners may have different points of interest regarding the same topic, which hinders in-depth exploration of the topic. Using a live dialogue format allows students to freely express themselves and display authentic interactive states. However, this part must be controlled within a time limit of no more than five minutes to allow sufficient time for interaction while avoiding the drawbacks of an excessively long duration. Additionally, a unified time control facilitates the comparison of language materials.

Regarding the scoring system for dialogue between candidates, an overall evaluation is conducted, followed by a hierarchical assessment for each participant. This is because spoken interaction is not just an individual speaker's behavior but a complex social practice process (Fairclough, 1992). In different situations, the level of performance exhibited by the same participant can vary significantly, largely due to the differing dialogue partners. Therefore, it is necessary to fully consider the factors

of the different dialogue participants in the scoring process. Firstly, an evaluation of the overall interaction is conducted, followed by separate assessments of each participant's interaction performance, as well as the cumulative evaluation of various components such as vocabulary and grammar in the spoken language. Finally, the scores are integrated based on the overall impression.

The automated dynamic interactive testing is proposed as a futuristic approach to the current form of Chinese oral proficiency assessment. Nevertheless, there are still many practical issues that need to be addressed in its development. For instance, the establishment of graded and topic-specific corpora, resolving computer technology-related problems, and ensuring the reliability and validity of scoring criteria. Without these factors being addressed, it cannot serve as a standard for selection and assessment. These challenges and issues pose a need for resolution for language teachers, learners, language testers, and computer technologists. Nonetheless, they also present new opportunities and directions.

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Intelligent technology, Risk challenge and Development path brought by Chat GPT to China's Higher Foreign Language Education

Abstract: Chat GPT is a new chat tool launched by American Open AI Lab at the end of 2022. As an intelligent language model with interactive function, it will help teachers reduce their workload, lead students to improve their comprehensive quality and promote the digital transformation of education model in the field of higher foreign language education in China. At the same time, it will also lead to academic trust crisis, emotional and moral defects, blocked transition process and other issues. This paper aims to explore the reasonable development path when artificial intelligence penetrates into traditional teaching methods: grasping the value and advantages brought by new trends in technology, and emphasizing the good reconstruction of moral thinking in humanities, re-examining the mode of getting along with teachers, students and schools in learning. Only by clarifying the instrumental status of emerging technologies can we better explore the relationship between teaching and technology and provide effective assistance for the innovation and development of higher foreign language education in China.

Key words: Chat GPT; Artificial intelligence; Higher foreign language education; Intelligent technology; Risk challenge; Development path

I. Introduction

On November 30, 2022, Open AI publicly released Chat GPT (Chat Generative Pre-trained Transformer), which is positioned as a new generation of chat robots (Floridi, 2020) that can use a language model with 175 billion parameters to explain and respond to natural language input. Its functions include not only traditional man-machine conversation, web search, information consultation, etc., but also poetry creation, code compilation and lecture writing, and it has become a leader in natural language processing tools with good performance (Luo Zhijia, Chen Weihong, 2023). Compared with the previous artificial intelligence products, Chat GPT has reached an amazing level in terms of knowledge reserve, cost-effectiveness and version upgrade, and launched a whirlwind in many industries around the world.

As a high-profile industry field, education has undoubtedly been influenced by

Chat GPT. According to Sina. com, more than 89% of college students in the United States are using Chat GPT to complete their homework and thesis writing. In November 2020, China's Ministry of Education issued the Declaration on the Construction of New Liberal Arts, which clearly stated that it was necessary to break through the traditional humanities methods, realize the unity of qualitative and quantitative, and apply modern science and technology, information technology, artificial intelligence and mathematical algorithms to the study of new liberal arts (Xu Fei, 2021). Under this background, the development of higher foreign language education in China will face brand-new opportunities and challenges. Only by correctly standing on the background of the times, following the advantages brought by intelligent technology and minimizing its adverse effects can we find a new development path for China's higher foreign language education.

II. Intelligent technology: the integration of intelligent language model and higher foreign language education

Chat GPT 's execution mode is pre-training based on LLM, which means that a large number of training data are entered first, and then integrated and calculated based on the training data, and the output results that meet the user's requirements are condensed (Zhu Guanghui, Wang Xiwen). Similarly, in the field of foreign language education, Chat GPT can also deeply analyze the laws and internal logic of education and teaching by ingesting massive data, so as to more accurately portray the student model, provide personalized solutions and help courses digitalization.

(A) LLM helps teachers reduce their workload.

LLM (Large Language Model) has great application value in automatic reply, intention recognition, human-computer interaction, rich scenes and so on. Therefore, the effectiveness of the big language model means that the entry of Chat GPT shows the burden reduction of teachers' work content to some extent.

From the teacher's point of view, the output form of Chat GPT law provides the possibility for designing teaching plans, constructing teaching models, consulting relevant literature, and independently marking papers.

This study designed a question for Chat GPT to answer, as shown in Table 1:

Table 1 Teaching plan designed by Chat GPT

Character	Content
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Tester Chat GPT	<p>Please write a lesson plan for general present tense grammar.</p> <p>Teaching objectives: After this lesson, students can correctly understand and use the general present tense grammar in English.</p> <p>Teaching content: Whiteboards and markers, manuscripts of exercises, and some examples of sentences in the general present tense.</p> <p>Teaching methods: Introduction, demonstration, practice, output and summary</p> <p>Teaching process:</p> <p>1. Introduction: (5 minutes) Welcome students and briefly introduce the teaching content of this lesson. Ask students to give examples of some activities they do every day. Write their examples on the whiteboard.</p> <p>2. Presentation: (15 minutes) Introduce the simple present tense and explain that it is used to describe activities or situations that occur regularly or repeatedly. Provide some examples of sentences in the general present tense on the whiteboard to discuss their structure and significance. For example, "I wake up at 7 o'clock every morning." "She walks to school." Discuss the consistency of subjects and verbs, and demonstrate the changes of verbs with different subjects (for example, "I walk", "they walk" and "he walks").</p> <p>3. Exercise: (25 minutes) Provide the manuscripts of the exercises for students to complete. Including filling in the blanks, completing sentences and transforming sentences in other tenses into the general present tense. Make sure to include regular and irregular verbs. Supervise and support students' work in practice. Review the answers with the students and ask them to discuss and explain their answers.</p> <p>4. Output: (10 minutes) Divide the students into groups or pairs. Ask them to write a short dialogue using the simple present tense. Encourage students to be creative and change in the dialogue. Organize several groups of students to act out their dialogues.</p> <p>5. Summary: (5 minutes) Review the key points involved in this lesson. Provide feedback on students' performance and encourage them to continue to practice using the simple present tense. Answer any questions that students may encounter.</p> <p>Extended activities (optional): Ask the students to write a paragraph describing their daily life and use the simple present tense.</p>
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As far as the teaching plan is concerned, the key words such as teaching objectives, teaching content, teaching methods and teaching process are very complete. Although the content is old, which is not conducive to teaching students in accordance with their aptitude and lacks innovative content, on the whole, an efficient basic framework can save time for compiling teaching plans.

From the student's point of view, personalized settings will be released. Relying on LLM architecture principle, personal information and behavior are entered, and Chat GPT can make a student behavior model and a portrait of a single student's personality in real time. Targeted analysis of psychological and physiological data, so as to integrate a personal tailor-style personalized evaluation. On this basis, teachers can omit some solidified and procedural steps to stimulate students' experience and interest in learning.

(B) Language intelligence leads students to improve their comprehensive quality

Language intelligence is an important part of the development of artificial intelligence, and its core lies in "imitation". In other words, it is the imitation of human language by computers, which makes the output more functional and feasible, improves the higher order of language teaching and learning, and thus contributes to

the improvement of students' comprehensive quality.

In terms of intellectual education, the involvement of Chat GPT has changed the monotonous teaching template in the traditional classroom and realized the novel mode of "digital plug-in into the classroom". The combination of pictures and texts and multi-dynamic courseware not only helps students develop in an all-round way in listening, speaking, reading and writing, but also improves the self-consistency and internalization efficiency of students' deep learning.

In terms of moral education, talented people with national feelings are the most urgently needed in China. Foreign language majors are most likely to be directly influenced by foreign cultures and most likely to form a trend of "cultural flattery". Only by sharing the world corpus, using Chat GPT to form interdisciplinary thinking, cultivating international vision and adhering to the feelings of home and country can we become an enterprising person in Do not forget your initiative mind.

In terms of aesthetic education, Chat GPT 's functions of creating songs and drawing images create a 3D teaching atmosphere, which improves learning efficiency and aesthetic appreciation. For example, by arranging an English composition about sunrise, Chat GPT can generate relevant pictures to help students brainstorm, as shown in Figure 1:



Figure 1 pictures generated by Chat GPT

In addition, interested students can also copy according to the pictures, expand their hobbies and explore their infinite possibilities.

(C) RHLF promotes the digital transformation of education model

RHLF (Reinforcement Learning from Human Feedback) is divided into three steps: first, pre-train a language model, then collect data and train the reward model, and finally fine-tune the language model by reinforcement learning. According to the feedback information and data, Chat GPT can make timely adjustments to produce a thinking mode closer to human discourse. This positive working method will inevitably lead to the digital transformation of the educational model and the

qualitative change of the teaching evaluation system.

The author has studied the subject papers of teaching evaluation in CNKI in recent ten years. It is also found that the papers on teaching evaluation can be started from several angles, namely, evaluation content, evaluation mode, evaluation method, feedback and so on. The summary is as follows:

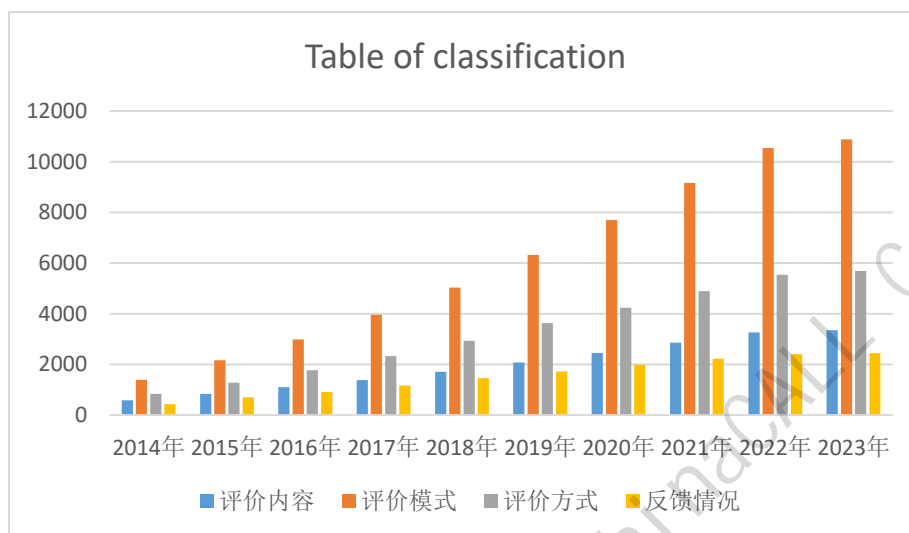


Figure 3 Table of classification

According to the evaluation mechanism of teachers, the evaluation content is not comprehensive; The evaluation model is single; The evaluation method is not efficient; Feedback time is often not timely enough. According to the evaluation mechanism of students, the evaluation content is too general; The evaluation model needs to be improved; Evaluation methods tend to ignore all-round development; Feedback only focuses on achievements.

However, in Chat GPT system, students can give feedback to important factors such as teachers' personality, teaching ability, teaching results and teaching methods at any time and place, and put forward their own suggestions and ideas. On the other hand, teachers can check students' feedback online, and improve their teaching plans and ideas on this basis.

More macroscopically, the feedback mechanism of the double helix can be applied to a larger space-time. For example, a full coverage feedback model is implemented in a certain region or province and city so as to contribute to the allocation of teaching resources for the education department and improve the teaching system.

III. Risk challenge: the potential risks brought by artificial intelligence to higher foreign language education

Bill Gates compared Chat GPT with the emergence of Internet and PC. But everything is not absolute, and the high-tech that attracts worldwide attention will also bring negative effects to mankind.

(A) Academic trust crisis

Plagiarism is a serious academic misconduct. Chomsky, an internationally renowned linguist, even thinks: "Chat GPT is plagiarism of language." (Chomsky, 2022) At present, the academic circles have not drawn a clear plagiarism boundary for the output results of Chat GPT, but when dependence comes into play, critical thinking will fall apart.

The phenomenon of ghostwriting is also fermented in the noise. The labor mode of enjoying success will only affect academic integrity and encourage the breeding of lazy thinking. China has been in a state of clear resistance, but there are still many restless people racking their brains to copy and paste the output of Chat GPT.

(B) Emotional and moral defects

At the beginning of the setup, a moral system was built into Chat GPT. If there are bad words and obscene songs in use, they will be classified as malicious problems, and Chat GPT will remain silent or euphemistically channel them. However, if users deliberately change the problem language mode, they will get information that violates public order and good customs by taking advantage of system loopholes.

The issue of ethical awareness has also become very subtle. First of all, the disclosure of data will lead to the disclosure of personal privacy, and being used maliciously will have irreparable disastrous consequences. Secondly, the ownership has not been decided. It is still unknown who the academic achievements without innovation and independence belong to. Finally, when it comes to politically sensitive topics, Chat GPT will give a "double standard" answer according to different countries, which has certain negative guidance.

Social skills gradually fade away. Because the language of Chat GPT is formatted and mechanized, it lacks understanding of human emotions. Students in the learning process will unconsciously imitate when communicating with them, ignoring the subtle changes of emotions and diluting the desire to interact with classmates and teachers.

(C) Blocked transition process

Relying on the changes in the evaluation system of the digital transformation of the above-mentioned educational model, in the process of integrating science and technology into education, it will inevitably lead to system resistance and various worries.

For students, the birth of Chat GPT eased academic anxiety and insecurity. Finish your homework on time and efficiently, and the time outside intellectual

education will be extended. However, the eye-catching high similarity will only solidify the thinking and reduce the interest in learning, which is not conducive to the all-round development of students. In addition, the phenomenon of "different brains between man and machine" will also reduce students' sense of identity with teachers.

For teachers, the feedback of similar homework destroys teachers' teaching in accordance with their aptitude and hierarchical teaching. On the contrary, it forces teachers to learn the thinking inertia of machines, making teachers' duties mechanized, which means that some functions of teachers have been swallowed up by machines to some extent. In addition, teachers' trust in students will be greatly reduced, which is not conducive to maintaining the mutual trust mechanism between teachers and students.

IV. Development path: Chat GPT provides new ideas for higher foreign language education

In the face of the "invasion" of artificial intelligence, we must not turn a blind eye, and it is the best choice to explore the response plan in time. The field of higher foreign language education in China should respond positively and turn "passive" into "active".

(A) Grasping the value and advantages brought by new trends in technology

From the initial appearance of computers to the large-scale use now, it is an issue in the new era to actively embrace AI language and promote the coordinated development of foreign language majors and digital intelligence, and it is also a new subject proposition put forward by China in recent years.

This study starts with the curriculum of six key universities in China, and based on the policy of benchmarking new disciplines and the requirements of the new national standard, this paper analyzes the new digital courses connected with foreign language majors on the basis of computer basic general courses.

Table 2 Computer general courses and Professional courses in six key universities in China

University	Professional courses	Computer general courses
Shanghai Foreign Languages University	History of British and American literature, introduction to English linguistics, survey of English-speaking countries, etc.	Media information processing, database foundation, dynamic web page making, etc.
University of Chinese Academy of Sciences	Language and cross-cultural communication, business communication English, British and American culture	C++ programming, introduction to Python language, practical skills of scientific and technological information retrieval and utilization, etc.

	and film and television, etc.	
Northwestern Polytechnical University	British and American culture, British and American literature, comprehensive English, translation, etc.	Solid works computer drawing, network graphics and image software application requirements, etc.
Beijing Normal University	Literature guide, history of western literature, functional linguistics, etc.	Introduction to statistics, multimedia foundation, web design, etc.
Shaanxi Normal University	English literature, American literature, an introduction to linguistics, an overview of English-speaking countries, etc.	Multimedia application technology and web design, ACCESS database application technology, etc.
Tianjin University of Science and Technology	Business English, English-Japanese bilingualism, British and American literature, comparative literature, etc.	Computer software programming, C language programming, etc.

The research shows that all the six key universities focus on the cultivation of digital technology on the basis of cultivating professional competence, which corresponds to the four requirements of National Standard (Ministry of Education, 2023): language tool ability, humanistic literacy ability, theoretical research ability and practical innovation ability.

Six key universities lead the trend of domestic universities, and their curriculum will be followed by other universities. However, due to the different development levels and resources of colleges and universities in China, academic gap and resource tilt are widespread. The emergence of Chat GPT has created an educational model and three-dimensional pattern in which traditional teaching methods and artificial intelligence are deeply embedded. Taking advantage of this trend, China can make in-depth research, formulate a local talent training goal, improve the professional structure and cultivate cross-cultural compound talents.

(B) Emphasizing the good reconstruction of moral thinking in humanities

The country has high hopes for the new youth. Therefore, good moral thinking is the key to students' all-round development, and "humanism" is the backbone of modern talents.

Credit evaluation system. The influx of Chat GPT has given birth to a large number of students' speculative thinking and opportunistic psychology, and the harm it brings cannot be underestimated. However, colleges and universities should not adopt the ostrich policy blindly, and need to work step by step to create a healthy and honest environment. Therefore, the credit evaluation system is particularly important. Schools can let students build correct values through lectures, publicity and other modes, and have a sense of identity with the integrity evaluation system.

The boundaries of deliberate cheating. Many students still boldly copy the conversation content of Chat GPT, which is nothing more than a kind of compassion.

If colleges and universities can make it clear that the papers generated by Chat GPT are plagiarism, and then put forward some punishment measures that can be controlled within colleges and universities, then the bad use of Chat GPT will definitely be improved.

Cultural confidence. The anxiety and worry caused by artificial intelligence is nothing more than human's lack of confidence in traditional culture and long-term dependence on science and technology. It should be noted that the culture and civilization precipitated by thousands of years of human history are the reasons for the endless education, and cultural self-confidence will lead people who are lost to happiness.

(C) Re-examining the mode of getting along with teachers, students and schools in learning

In the era of artificial intelligence, the trend of digital classroom is imperative. Chat GPT 's entry brought innovation on the basis that the original school provided teachers with curriculum plans and teachers customized teaching plans for students.

Schools can reasonably put Chat GPT between teachers and students to promote teachers and students to improve the efficiency of their studies together; Teachers can use their interactive functions to develop new skills, such as simulating the classroom, replaying the class situation, and giving feedback to students and schools; According to their own situation, students strengthen and innovate, give ideas and suggestions to teachers and schools' curriculum plans, and also enhance the core competitiveness of schools. The relationship is shown in Figure 4:

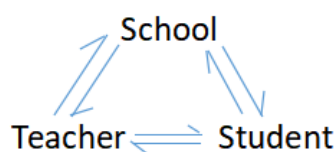


Figure 4 Table of Interaction among Schools, Teachers and Students

From the opposite perspective, the multi-dimensional feedback from schools, teachers and students on Chat GPT can also provide data support and evidence-based for researchers, make the language output mode of artificial intelligence more "human-like" and complete the virtuous circle of "man-machine synchronization, hand in hand".

V. Conclusion:

The era of human and artificial intelligence has officially kicked off. Chat GPT forms massive data by deeply connecting multi-domain information, and the real-time

man-machine dialogue mode brings many conveniences to the field of higher foreign language education in China. However, in the face of the phenomenon of uncontrolled "feeding" of emerging tools, we can no longer sit on the sidelines, and only by actively adapting and actively practicing can we gain true knowledge. Only practice can effectively test the educational value brought by artificial intelligence; Only by testing its educational value can we explore a reasonable development path for China's higher foreign language education. Only when human and computer are in the same frequency can we effectively find a breakthrough in teaching, help the modernization of foreign language education in China universities and construct a new form of human civilization.

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Exploring the Impact of Social Annotation on Reading Comprehension and Critical Thinking: An Intervention Study

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Abstract: *The research examined the impact of social annotation on reading comprehension and critical thinking. The intervention was conducted by requiring participants to read and annotate via MS Word. Samples consisted of twenty-five senior students from a university in Guangdong province, China. Students were equally distributed into an experimental group and a control group. Reading comprehension and critical thinking ability were assessed before and after the intervention. The results showed that despite slight statistical differences, social annotation technology might be an effective tool to engage readers in L2 reading comprehension and critical thinking.*

Key words: social annotation, reading comprehension, critical thinking

1. Introduction

Reading comprehension and critical thinking, as two essential skills to process large quantities of information more effectively (Grabe, 2008)^[1], have existed as two problems among Chinese EFL learners for many years. For example, on English class, Chinese EFL learners preferred to believe in the absolute authority of teachers, rather than queried teachers' utterances (Dong, 2020)^[2]. They made perfunctory efforts in dealing with interpretive assignments which demanded their ability to select and synthesize information critically. Chinese EFL learners might lack the confidence of critical thinking. They could not handle interpretive assignments very well (Nejmaoui, 2019)^[3]. They did not care much about logic, but they were susceptible to prejudices, and unwilling to explore challenging topics. In general terms, Chinese EFL learners were not good at comparison, reasoning and argumentation when doing assignments on their own. There is an urgent need to explore ways to facilitate reading comprehension and critical thinking.

With the boom of online education, innovative educational technologies continue to emerge. Social annotation (SA) technology has commonly been viewed as an effective measure to help teachers to organize collaborative learning activities. According to many (e.g. Johnson et al., 2010)^[4] in the field, SA technology is essentially an online platform specifically constructed for social collaboration. Furthermore, SA technology provides with readers an access to external multi-media resources, allowing them to highlight key points individually, and if they wish, they can selectively share some information with others and discuss a specific text section on the right margin of a digital paper, annotate and attach some useful URL links for other readers (Murphy, 2021)^[5]. enables students to collect electronic resources, annotate and highlight these resources. SA technology can meet the requirements of both synchronous and asynchronous online discussions (Clapp et al., 2021)^[6]. Meanwhile, SA technology can also be adopted for asynchronous discussions when students need to do some reading tasks prior to a session. SA technology can be viewed as an acceptable tool for teachers to collect inquiries from students and examine the learning effect. As discussed above, social annotation technology might be a reasonable approach to tackle the issue of interaction deficiency in online learning. The purpose of this study is to determine the effects of social annotation on reading comprehension and critical thinking for EFL learners.

The specific research questions are:

What effect does the use of a social annotation app have on reading comprehension?

What effect does the use of a social annotation app have on critical thinking?

2. Literature review

2.1 Reading comprehension

There is a consensus among scholars that reading comprehension involves lower-level processing and higher-level processing (Grabe, 2008). Word recognition model and syntactic-parsing model were adopted to interpret the lower-level processes, which are not necessarily inferior, but are likely to

become strongly automatized and help readers become more fluent in reading. When a reader is equipped with knowledge of both vocabulary and syntax, he or she might utilize more available resources for higher-level processing, which are not necessarily superior, but possibly involve more complex decoding mechanisms. As noted by Grabe (2008), the text model has come to be used to refer to understanding of the literal meaning, defined as ‘comprehension’, while the situation model has been used to refer to conditions where readers need to associate the given text with their personal experience or background knowledge, defined as ‘interpretation’. Applying higher-level processing models to social annotation, if annotations reflect one’s understanding of the literal meaning of sentences or one’s own clarification of the implied meaning, text comprehension or situation interpretation processes may work.

2.2 Critical thinking

Critical thinking ability was widely assumed to be closely related to reading comprehension ability (Aloqaili, 2012)^[7]. Widely varying definitions of critical thinking ability have emerged. Several attempts have been made to measure critical thinking ability, among which the California Thinking Skills Test: the Delphi Report (Facoine, 1990)^[8] and the HEIghten™ Critical Thinking Test (Shaw et al., 2020)^[9] were two of the most widely used assessments of critical thinking skills.

2.3 Social annotation

It is necessary to clarify exactly what is meant by “social annotation”. Historically, the term “annotation” referred to written language at the margin of manuscripts which were often spread among writers and literary enthusiasts. Its meaning has evolved. Nowadays, “annotation” is generally understood as behaviors of highlighting personal copies, “adding illustrations to an existing text with the purpose of information sharing, online discussion, promote further investigation and facilitate a deeper understanding” (Murphy, 2021, p. 157). Several taxonomies for social annotation tools have been developed. Rim (2012)^[10] argued that there were two broad categories of annotation tools, which are: a) social annotation tools (e.g. NowComment, Perusall, Diigo, etc.) and b) text annotation tools (Google Docs, MS Word, etc.) on the basis that the latter failed to provide an online social platform for information sharing and users or instructors had to share manually an MS Word or PDF via email. However, Rim (2012) overlooked the fact that “social annotation” emphasized the social attribute of annotations that can be shared and discussed publicly, contrary to individual annotations used for self-study. Therefore, the present study adopted MS Word as the social annotation tool

SA technology has potential educational values, thereby it is worth implementing into online class. Annotation practices are particularly useful for knowledge sharing within collaborative learning frameworks. According to Johnson et al. (2010), SA technology is essentially a form of computer-supported collaborative learning (CSCL), whose educational values for team-learning can be listed as follows: a) help knowledge construction and skill practice; b) improve time-management and self-control skills; c) cultivate communication skills; d) encourage knowledge sharing from various perspectives; e) create a climate of active learning; f) boost the learning spirit of individual students; g) facilitate higher level thinking skills e.g. meta-cognitive and analytic and critical thinking skills. In summary, SA tools can be used as auxiliary instrument to foster higher-level thinking through collaborative learning activities

3. Methodology

3.1 Participants

A total of 25 senior students were recruited from a university in Guangzhou City, Guangdong province, China. All of them attended Advance Academic English Writing Skills Module. They began learning English from Year 8 until now (Mean age=21.8, SD=1.2, 13 male and 12 female). Most students passed TEM-4, one of the standardised English proficiency examinations in China and were identified as modest or competent English users.

3.2 Procedures

A quasi-experimental pre-post-test design was adopted. For the intervention group, how to use SA technology was introduced. Control group was a ‘business as usual group, where students were required to do the same amount of reading as intervention group without the assistance of SA technology. The intervention lasted for four weeks in total. In the intervention group, how to use SA technology was introduced at the beginning of the intervention period. Every Monday, I uploaded a 400-word essay in Word format onto a public mailbox via OneDrive, then sent all participants a

reminder email. The intervention group members were required to use SA technology embedded in MS Word. For the control group, participants were given the same reading materials as intervention group but were not required to annotate. Data were collected by personal emails (i.e. intervention group members sent the passages along with annotations to me by the end of each week). Descriptive data from pre- and post- test post-tests were used to create line graphs with multiple variables to visualise the data. Prior to analysis, data screening was carried out to test whether data were suitable for analysis using parametric tests. Then I ran a repeated 27 measures analysis where the ANOVA test demonstrated results of Tests of Within-Subjects Effects and Tests of Between-Subjects Effects, Levene's test of Equality of Error Variances and Post Hoc Multiple Comparisons. Annotations were classified based on collaborative learning theories, and audio-recording of focus group was also transcribed.

4. Results

4.1 The Role of SA Technology in Facilitating Reading Comprehension

4.1.1 Quantitative results

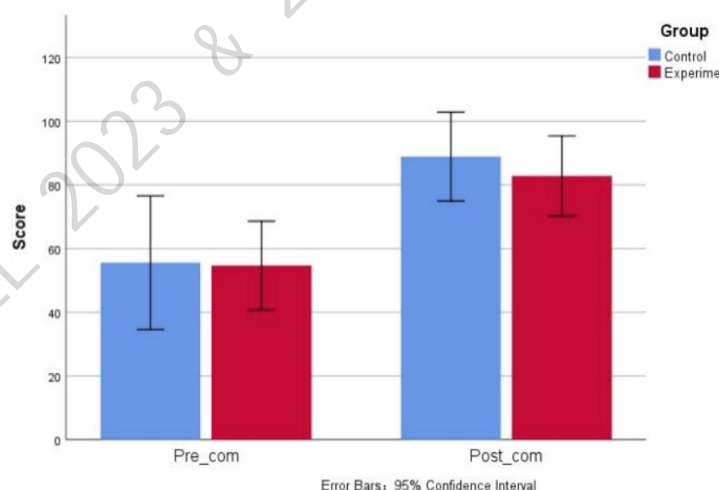
The first research question addressed if there is a difference between the two groups' performance on reading comprehension at two testing points. Looking at table 1, the control group has made greater progress. As can be seen from figure 1, no statistically significant difference between the two groups was found. A mixed analysis of variance was conducted to examine the impact of two treatments on participants' scores of reading comprehension, across two testing periods (pre-test, post-test). There was a substantial main effect of Time (pre-test, post-test), Wilk's Lambda = 0.533, $F(1, 23) = 20.142$, $p < 0.001$, partial eta squared = 0.006, with both groups showing an increase in the scores of reading comprehension across the two tests (pre-test, post-test). The main effect of Group (annotation and non-annotation) was not significant, $F(1, 23)=0.215$, $p=0.68$, partial eta squared=0.009, suggesting that students reading with SA technology and those without using SA technology did not differ from each other. There was no significant interaction between time and group, Wilk's Lambda=0.994, $F(1, 23)=0.145$, $p=0.664$, partial eta squared=0.006. Therefore, there was no statistical difference between the experimental and control group in the changes from pre- to post-scores.

Table 1: Comparison between the performance of experimental group(annotation group) and control group(non-annotation group) on reading comprehension ability at two testing points.

	Pre-test		Post-test	
	M	SD	M	SD
Experimental(N=16)	54.69	26.17	82.81	23.66
Control(N=9)	55.56	27.32	88.89	18.16

Note. "Experimental"=experimental group; "Control"=control group.

Figure 1: Comparison of the participants' scores of reading comprehension



Note. "Pre_com" mean that the scores of reading comprehension at pre-test. Likewise, "post_com" means scores of reading comprehension at post-test.

4.1.2 Qualitative results

In addition to statistic analysis of both pre-test and post-test in reading comprehension, this research

also analyzed the content of annotations(see Table 2) that verbalized psychological representation involved in human text comprehension along with their comments when L2 learners were reading read literary texts. Coding suggested that social annotation apps aided L2 readers in abilities of word recognition, syntactic parsing, text-model comprehension and situation-model interpretation, all of which were key concepts in well-recognized cognitive models of reading as reviewed in Grabe(2008).

On top of that, as can be seen in table 3, focus group transcripts suggested that SA technology was a mixed blessing for L2 reading comprehension. Themes associated with positive comments included time saving, enhanced understanding and improved reading efficiency. By contrast, the only theme associated with negative comments was categorized as extraneous cognitive load.

Table 2: Coding of annotations that reflect cognitive process of reading

Categories	Action	Examples
Word recognition	rapidly identifying the word forms, assessing mental lexicon	I think, “diminish”, in this sentence, means “slowly decreasing in number because of constant consumption”.
Syntactic Parsing	Identifying key structures and grammatical resources; reading with cueing systems (tenses, articles, quantifiers, etc.)	In this sentence, “results from failure” is a modifier of “frustration”.
Text-model comprehension	Simple inferencing and content restructuring	Maybe we can combine it with the last sentence, “the more futile the task”. I think the task means “arguing with the mind”.
Situation-model interpretation	Integration of prior knowledge with the text (attitude of the author)	The writer describes his failure in detail. We can see that our self-control ability is important for us to stick to something.

Table 3: Thematic analysis of perception over the use of social annotation in enhancing reading comprehension

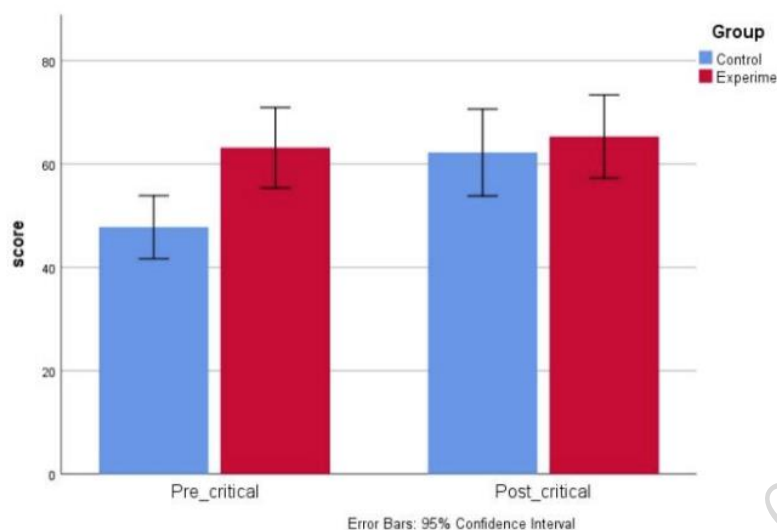
Example responses	Codes	Thematic Analysis
“Clear interface and easy to operate.”	Accessibility and compatibility	Time saving
“It’s great to share comments with peers in such a formal way.”	Absorption of multiple perspectives	Enhanced understanding
“Easy to take notes and highlight”	Note-taking	Reading efficiency
“Sometimes there are too many comments to read”	Disruption and muddledness	Extraneous cognitive load

In summary, the quantitative analysis showed that SA technology facilitated reading comprehension of experimental group and the reason why control group has made greater progress than experimental group needs further exploration(see Figure 1). On top of that, annotation codings indicated that SA technology enhanced reading comprehension by assisting readers in information procesing. Furthermore, thematic analysis of user perception demonstrated that despite its effect in facilitating reading comprehension, there were still concerns over the potential cognitive loads. This can have implication on how to improve SA technology interface by adjusting highlighting and taking into account some user comments.

4.2 The Role of SA Technology in Enhancing Critical Thinking

The second research question addressed if there is a difference between the two groups’ performance on critical thinking at two testing points. Looking at figure 2, no statistically significant difference between the mean scores of the two groups was evident. A mixed between-within subject analysis of variance was conducted to examine the impact of social annotation on participants’ scores of critical thinking, across two testing periods (pre-test, post-test). There was a substantial main effect for time, Wilk’s Lambda=0.760, $F(1, 23)=7.272$, $p < 0.05$, partial eta squared=0.240, with both groups showing an increase in the scores of critical thinking across two tests (pre-test, post-test). The main effect comparing the performance of critical thinking between annotation and non- annotation group was not significant, $F(1, 23)=4.054$, $p=0.892$, partial eta squared=0.150, suggesting no difference in the effectiveness of the two treatments. There was no significant interaction between time and group, Wilk’s Lambda=0.852, $F(1, 23)=3.984$, $p=0.721$, partial eta squared=0.006. Therefore, there was no statistical difference between the experimental and control group in the changes from pre-to-post scores.

Figure 2: Comparison of the Average Scores of Critical Thinking between Two Groups



4.2.2 Qualitative results

In addition to statistic analysis of both pre-test and post-test in critical thinking, this research also analyzed annotations (see Table 4) that verbalized psychological representation involved in critical thinking along with user responses. Coding suggested that social annotation apps aided L2 readers in analytical and synthetic skills, both of which were key components of critical thinking skills, as identified in the theoretical framework of Liu et al. (2016)^[11].

Additionally, as can be seen in Table 5, focus group transcripts suggested that comments on the effect of SA technology on critical thinking varied: themes associated with positive comments included critical thinking mindset and enhanced problem-solving skills, meanwhile, negative feelings mainly came from users not being comfortable when to exchanging ideas with strangers.

Table 4: Coding of annotations that reflect mental representation of critical thinking

Categories	Action	Examples
Analytical skills	Analyzing and evaluating argument structure (e.g. identifying the unstated assumptions and flaws in reasoning)	I cannot help but wonder: do ants really have such a strong ability to plan routes? [a story about ants]
Synthetic skills	Evaluating evidence and its use (e.g. estimating the rationale, context, relevance, and strength)	One of the views held by the author is <i>whiteboard theory</i> , which means that people's understanding of the world is formed. But this may encounter opposition from positivism. [a brief introduction to Anthropology]

Table 5: Thematic analysis of perception over the use of social annotation in enhancing critical thinking

Example responses	Codes	Thematic Analysis
“When I was navigating through the annotations, I do not swallow them whole, but try to distinguish whether they were true or false.”	Discern the truth	Critical Thinking Mindset
“Multiple perspectives allowed us to form an in-depth understanding of the facts and issues.”	An holistic approach	Enhanced problem-solving skills
“I was not comfortable with arguing with people, though in written language.”	Fear of embarrassment	Negative emotions
“I struggled to understand peers’ questions to my annotations. Sometimes I couldn’t understand them clearly.”	Anxiety	

In summary, the quantitative analysis showed that SA technology facilitated critical thinking of experimental group and the reason why control group has made greater progress than experimental group (see Figure 2) needs further exploration. On top of that, annotation codings indicated that SA technology enhanced critical thinking by developing their analytical skills and syntactic skills. Overall, perception of the effect of SA technology on critical thinking is positive, despite slight embarrassment among users. This can have implication for teachers to use SA technology as a platform for organizing discussions on class and collecting anonymous peer feedback after class.

5. Discussion

The present study did not provide scientific empirical evidence of the effectiveness of SA technology in either reading comprehension or critical thinking. Possibly they are genuinely not effective, with inherent unsolved challenges (Johnson et al., 2010)^[4]. There are two likely methodological causes for the result. Firstly, with a small sample size, the current research may not have the statistical power to expose such a small effect, thereby leading to a type II error. One possible explanation for this might be that the participants selected by the current research just happened to be not representative. Secondly, there might be some unknown defects with SA technology embedded in MS Word. Unlike other social annotation app such as Perusall and NowComment with very prominent function reminders, it seems possible that participants may work independently rather than interact with others via MS Word, thereby weakening the effectiveness of SA technology.

6. Conclusion

The present study has investigated the impact of social annotation technology on reading comprehension and critical thinking. It was hypothesised that social annotation did play a role in enhancing both reading comprehension and critical thinking. However, quantitative results did not show a significant difference between the annotation group and the non-annotation group, possibly because the intervention only lasted about four weeks, which did not result in a remarkably prominent effect.

SA technology is not completely negative. There is abundant room for future progress in determining the effect of SA technology. Firstly, future research should be undertaken with a large sample and a longer intervention, so that the changes in annotations and both reading skills can be fully captured. A further study with a randomised controlled trial is therefore suggested. Secondly, future studies could develop or adopt more comprehensive assessments in measuring reading comprehension and critical thinking. Last but not least, to figure out if the disappointing results are due to some inherent shortcomings of MS Word, as a particular annotation tool adopted by the present research, a comparison study between the effects of various SA tools is also needed.

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From Chances to Challenges in the Digital Age: Psychological Transformation in Teachers in Chinese Higher Education

Zou Deping and Hafriza Binti Burhanudeen

Abstract: Digital education has experienced a swift evolution, fundamentally reshaping conventional teaching and learning methods to a certain degree. The amalgamation of information technology and English instruction into the digital era has brought forth a surge of digital teaching tools, broadened teaching resources and environments, inventive teaching and learning methods, as well as digital teaching evaluation and management, all of which have gained growing prominence. In this context, English as a Foreign Language (EFL) teachers must possess language proficiency and pedagogical knowledge while leveraging the transformative power of digital technology to enhance their digital literacy, finally, which can foster EFL students' digital literacy. There is a growing body of research on EFL teachers' digital literacy; however, there has been limited focus on their psychological transformation when encountering digital education, which is entirely new to them. This paper employs a review paper approach to examine and tackle the various chances and challenges encountered by EFL teachers in English digital education. By doing so, this paper aims to explore how EFL teachers can adjust their teaching willingness, enhance their teaching pedagogy, and modify their teaching methods. This transformation will empower them to thrive in the context of digital English teaching reform, which is propelled by advancements in the digital age. The discussions and conclusions in this article will offer valuable insights for EFL teachers in Chinese higher education on how to achieve a positive psychological transformation.

Key words: the digital age; EFL Teachers; chances; challenges; psychological transformation

1. Introduction

The modern technologies of the digital age have significantly transformed the way individuals communicate with each other (Yadav et al., 2018). In recent times, the proliferation of online technological advancements and the continuous expansion of electronic devices have provided language learners with ubiquitous and authentic language exposure. The use of modern technologies has facilitated English as a Foreign Language (EFL) learners to participate in language learning within the

educational context (Rassaei, 2017). Several studies have explored the effects of incorporating different technologies in education (Benson & Chik, 2011), the role of face-to-screen language learning is crucial in fostering language proficiency (Fathali & Okada, 2018). The integration of technology in classroom instruction entails more than just teaching computer skills; it requires EFL teachers to seek innovative approaches to enhance their students' motivation and foster their learning. As the educational benefits of digital information technology have become evident, digital technology has become increasingly intertwined with the teaching and learning of EFL. If EFL teachers do not possess an advanced level of digital competence, they will be unable to develop the same skill set in their students (Ramírez-Montoya et al., 2017). Therefore, it is essential to study the challenges and chances for EFL teachers in the digital age through a review paper approach. By understanding their psychological transformation, appropriate suggestions and measures can be developed to help them overcome challenges and make the most of the chances presented by the digital age.

2. Changes and Chances for EFL Teachers in the Digital Age

Integrating technology would enhance teaching effectiveness and decrease the challenges associated with implementing student-centered teaching methods (Ahmad & Ibrahim, 2017; Kafyulilo et al., 2016). Academics contended that ongoing professional development is beneficial in imparting technological expertise and addressing any possible apprehension arose by digital information technology (Kafyulilo et al., 2016; Huang et al., 2019; Huang et al., 2021).

2.1 Changes and Chances in Teaching Tools, Resources and Environment

Upon entering educational settings, a considerable proportion of students come equipped with prior experience in utilizing digital tools and engaging in digital environments to construct meaning (Yamada-Rice, 2011; Potter, 2012). EFL education and instruction have progressed and made available for general or specific intentions, like MY Access!, WriteToLearn, Criterion, Pigai, iWrite, FiF Speaking Practice, and IELTS Smart Learning, which provides convenience, involvement, and interaction in the teaching of EFL English (Du & Gao, 2022). From a learning standpoint, these apps and learning platforms provide EFL students with tailored study materials, immediate feedback, and automated evaluation of their strengths and weaknesses. In addition, digital online learning platforms based on big data can provide historical data on EFL students' classroom performance, assignment

completion, and overall achievements.

The impact of Computer-Assisted Language Learning (CALL) on language skills was examined and discovered that incorporating technological advancements, such as the internet, can enhance the reading abilities of learners and facilitate effective communication among EFL learners (Bensalem, 2020). Technology empowers students to generate, gather, store, and harness knowledge and information, while also enabling us to connect with individuals and resources across the globe. It facilitates collaborative knowledge creation, as well as the distribution and utilization of knowledge products (Von Davier et al., 2017). The digital tools, products and resources are composed of digital learning environment, in which learning activities and interactions between EFL students and their peers or instructors take place (Redecker & Punie, 2017). With the help of digital resources and environment, EFL students can adapt to digital interactive learning and foster autonomous learning ability and critical thinking.

In general, the evolution of teaching resources and environments driven by digital information technology has an unparalleled impact on traditional English classrooms. EFL teachers are encouraged to lessen their workload, acquire knowledge about individual students or entire classes, and develop novel teaching techniques (Baker & Smith, 2019). These digital teaching tools can not only provide fewer comments on lexical or syntactic mistakes but also concentrate on tailored guidance by utilizing learning pathways (Link et al, 2020).

2.2 Changes and Chances in Teaching and Learning Methods

Due to its ongoing advancements, digital technology has altered both teaching methodologies and learning strategies (Hollands & Escueta, 2020). Based on the changes in teaching tools brought about by digital education discussed above, corresponding changes are also quietly being reflected in EFL classrooms. This includes the ways in which teachers teach and students learn, which are gradually moving towards a culture of digital teaching and learning.

The integration of modern technologies has revolutionized the landscape of EFL learning in academic environments (Rassaei, 2017). Various research studies have explored the influence of incorporating different technologies in education (Benson and Chik, 2011). In this context, the role of face-to-screen language learning plays a pivotal role in fostering language proficiency (Fathali and Okada, 2018). However, the effective integration of technology in classroom instruction goes beyond the mere

teaching of computer skills; it necessitates EFL teachers to explore innovative approaches that boost student motivation and facilitate learning. With the clear educational advantages offered by digital information technology, digital technology has become increasingly intertwined with the teaching and learning of EFL. Consequently, without a proficient level of digital literacy, EFL teachers would struggle to cultivate the same skill set in their students (Ramírez-Montoya et al., 2017).

In conclusion, the widespread application of digital technology provides a feasible path for transforming EFL teachers' work performance, which enables EFL teachers to invest more time and energy into innovating teaching content, researching teaching technology, reforming teaching methods, and attending to the individualized growth of students.

2.3 Changes and Chances in Teaching Evaluation and Management

Numerous scholars (Eurydice, 2011; Selwyn, 2011) have emphasized the significance of aligning technological innovation with pedagogical innovation in order to bring about a genuine transformation in education. Accordingly, big data analysis and management in English learning are integrated into the entire education process through digital management. On the one hand, digital tools can help EFL learners to reading skills and vocabulary knowledge (Hassan Taj et al., 2017), which also can provide learners with corresponding intervention measures to help them understand learning rules, predict learning outcomes, identify deficiencies, make timely adjustments, and promote effective learning, ensuring teaching management is precise, relevant, and dynamic. On the other hand, it can assist EFL teachers in conducting a deep analysis of learners' learning trajectory and behavior, conducting large-scale independent assessment and management of the learning process as well as EFL students' behavior, and developing personalized and precise learning plans based on big data regarding students' learning characteristics. The deliberate appeal, efficacy, and utility of digital tools can have a positive impact on EFL learners' motivation (Wei, 2022).

On a whole, digital information technology enables formative evaluation, terminal evaluation, and online and offline evaluation to provide timely and personalized feedback for EFL students. This allows for the adjustment of teaching management by EFL teachers, ultimately achieving the goal of promoting students' learning through

evaluation.

3. The Challenges for EFL Teachers in the Digital Age

The anticipation of chances causes an increase of aspiration and motivation to apply digital information technology in teaching (Donovan et al, 2011). The integration of technology alters the dynamic between teachers and learners, as well as their respective roles within an educational setting (Alshammari et al., 2018). As facilitators and mediators of digital knowledge and skills, EFL teacher roles extend beyond transferring subject knowledge to equipping students with twenty-first-century competencies (Madalińska-Michalak & Bavli, 2018), which include digital literacy and readiness (Godbey, 2018). In light of the significant changes in English education brought about by the digital age, EFL teachers should seize new opportunities and bravely confront challenges.

3.1 The Challenges for EFL Teachers' Willingness on Digital Literacy

As digital education is an irreversible trend, there is a need to explore the willingness of EFL teachers towards technology and its integration in teaching practices. EFL teachers exhibited high levels of confidence in utilizing digital technology to enhance their teaching practices, both within the classroom and beyond (Cote & Milliner, 2018). Evaluating the acceptance of technology provides a means of assessing teachers' willingness to integrate new technologies into their educational practices (Scherer et al., 2021). While EFL teaching is not limited to technical knowledge and skills, there are still affective factors that play a role in the EFL teaching process, such as self-efficacy and attention. Furthermore, EFL teachers' digital literacy and self-efficacy vary based on factors such as teachers' experience, engagement in ICT training, and the time they spend online (Kahveci, 2021). Other studies shows that various teacher variables, such as professional knowledge, techniques, and affective attributes, contribute to the quality of instruction (Amirian & Behshad, 2016). Zhang and Kenny (2019) examined how prior technology experiences, training, and support influenced EFL teachers' levels of digital literacy, revealing that these factors significantly shaped their proficiency in digital skills. EFL teachers' attitudes towards using technology in instruction, discovering that their attitudes were influenced by factors such as their familiarity with technology, their perceptions of its usefulness, and their concerns about potential drawbacks associated with its implementation (G. Li et al., 2019). These studies shed light on the various elements that impact EFL teachers' digital literacy, highlighting the importance of prior experiences, training,

support, and attitudes towards technology in shaping their competence in using digital tools effectively in the classroom.

As a result, in addition to adapting to teaching changes brought about by the shift in digital information technology at the awareness level, EFL teachers also need to participate actively in training and learning related to digital literacy. EFL teachers can experience a notable improvement in their self-efficacy for integrating technology into their teaching practices after professional digital literacy training, like computer-assisted language learning (CALL) program (Liu & Kleinsasser, 2015).

3.2 The Challenges for EFL Teachers' Pedagogy on Digital Literacy

With the advent of digital education, a plethora of diversified, data-oriented, and intelligent teaching tools have emerged. The intricate and ever-evolving classroom environment necessitates a flexible approach to teacher pedagogy(Choi & Lee, 2009). EFL teachers demonstrated a favorable disposition towards employing digital literacy in EFL teaching(Pratolo & Solikhati, 2020). However, challenges arose in effectively blending technology with pedagogy and subject-specific teaching(B. Li, 2022). Moreover, due to the limitations of relevant artificial intelligence technologies, teaching tools such as educational robots cannot fully replace the role of English teachers in the classroom. Mere access to technological facilities does not ensure the effective integration of technology into lessons(Nuroh et al., 2023). The rapid progress of technology requires educators to have technological literacy and proficiency. EFL Teachers are expected to have not only pedagogical skills but also expertise in utilizing digital media (Tejedor et al., 2020; Tyner, 2011).If teachers face difficulties in operating digital communication tools, it can disrupt the smooth flow of learning in the current era of digitalization (Akbar & Anggaraeni, 2017). Additionally, EFL teachers are supposed to compensate for the emotional, moral, and humanistic limitations of AI.

In the realm of EFL teachers' digital literacy on pedagogy, two prominent trends are evident. For one thing, educational systems worldwide are incorporating digital skills into their curricula and assessments(Buitrago Flórez et al., 2017; Siddiq et al., 2016). For another thing, there is a growing emphasis on encouraging teachers and teacher educators to integrate technology into their instructional practices, either as a tool to enhance learning or as a method of formative assessment(Shute & Rahimi, 2017; Straub, 2009).

3.3 The Challenges for EFL Teachers' Teaching Methods on Digital Literacy

With the emergence of digital technology, EFL teachers encounter a fresh array of challenges and pressures (Romeo et al., 2013), including teaching methods. Utilizing technology in EFL educational contexts not only aids EFL students in acquiring a foreign language, but also bolsters their motivation levels (Abdulrahman and Basalama, 2019). The presence or absence of teacher digital literacy can also influence how teachers perceive their students' digital literacy abilities (Cosby et al., 2023). Contemporary EFL teachers demonstrate confidence in utilizing technology; however, they often lack confidence in designing technology-supported learning materials and curricula (Kessler, 2018). In addition, the degree to which teachers incorporate technology into their teaching and learning activities remains uncertain. Research studies suggest that the integration of technology is a complex process that involves transforming education, and the adoption of technological tools in schools varies significantly (Fraillon et al., 2014). Accordingly, the enhancement of EFL Teachers' teaching methods on digital literacy is also a complicated process. Bottino (2020) emphasized that the integration of technology in education has followed two main directions. Firstly, it involves cultivating competences and skills in students to prepare them for a society deeply influenced by technological advancements. Secondly, it entails harnessing digital technologies, methods, and tools to create innovative teaching and learning environments that encourage new pedagogical approaches across different disciplines. The first direction has spurred research into the technical and conceptual competencies necessary for effectively engaging with digital technologies. In contrast, the second direction has highlighted the transformative potential of digital literacy in reshaping teaching and learning environments, as well as instructional approaches within specific subject areas. Moreover, EFL teachers should also fully utilize the moral education and ideological functions of English to meet the new requirements and challenges of the digital education era. This includes the need to help EFL students identify and resist harmful information and form good values, which are essential components of the basic role and educational tasks of EFL teachers.

4. Conclusion

Digital literacy brings about transformative changes and poses challenges for educators, as it encompasses essential skills, learning methods, and educational environments (Peled, 2021). Accordingly, a new era of English education reform has arrived. This article explores the chances and challenges that EFL teachers encounters

during the digital age, the discovery can serve as a valuable consideration for policy makers in enhancing school technology infrastructure to foster increased engagement in learning.

The objective of education has shifted towards equipping students with digital literacy, empowering them to navigate the complexities and dynamics of modern societies (Fraillon et al., 2014). Teachers with higher levels of digital literacy demonstrated a greater propensity to incorporate technology into their instructional practices (Kwon et al., 2021). Similarly, Al-Khatib (2020) investigated the correlation between EFL teachers' digital literacy and their pedagogical approaches, unveiling that EFL teachers with advanced digital literacy skills were more likely to integrate technology into their teaching methods on a more frequent basis. These research endeavors provide valuable insights into the convergence of digital literacy and EFL education, underscoring the significance of digital literacy for effective instruction and professional growth.

While digital technology has revolutionized English teaching, there is still a long way to go before achieving deep integration of digital technology and English education at both practical and theoretical levels. Many teachers hold a favorable view of integrating digital platforms into the classroom, there is often a gap in their pedagogical expertise to effectively combine specific instructional methods with technology (Nuroh et al., 2023). It is vital to recognize that relying solely on EFL teachers is inadequate for achieving the deep integration of digital education and English learning. Therefore, fostering cross-cultural and cross-disciplinary collaboration between artificial intelligence professionals and experts in the field of English education is crucial. It can be drawn insights from foreign academic achievements in artificial intelligence and related fields and identify the areas of innovation for artificial intelligence and English education to further strengthen the practical application of artificial intelligence in English teaching. This will pave the way for deepening the integration of digital education and English learning, resulting in an English education system that promotes personalized learning and lifelong development, ultimately advancing English education in the direction of individuation, intelligence, precision, and ecology.

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GLOCAL 2023 & 2023 19th Chi naCALL Conference

A bibliometric analysis of artificial intelligence in second language (L2) learning and teaching (2000-2022): contribution, foci, challenges, and opportunities

1. Introduction

Upon the integration of computers into our daily lives, the prospect of incorporating them into language education emerged as a promising avenue for enhancing the learning encounter. This promised augmentation encompasses the improvement of learning outcomes, acceleration of progress, and facilitation of instructional efforts by educators (Kessler, 2018). In the 1970s, the concept of Computer-Assisted Language Instruction (CALI) introduced novel prospects, swiftly succeeded by the more learner-centric framework termed Computer-Assisted Language Learning (CALL). Subsequent decades witnessed the integration of a diverse array of tools within the language classroom, as the advancement of computer technologies, such as artificial intelligence (AI). The concept of Artificial Intelligence (AI) denotes "a science and a set of computational technologies that are inspired by—but typically operate quite differently from—the ways people use their nervous systems and bodies to sense, learn, reason, and take action." (Stone et al., 2022, p. 2) This evolution has indelibly influenced the domain of language learning, ushering a transformative wave into the well-established CALL in both formal and informal language learning contexts and opening a new research field of Intelligent Computer-Assisted Language Learning (I-CALL).

The integration of AI into CALL affords a more authentic and natural language learning context. Moreover, AI-powered functionalities such as visual perception and speech recognition, synergistically coupled with the capabilities of computers, enable massive data storage, processing, and analysis. The patterns found in the data can serve as a solid basis for making comprehensive decisions about learners' proficiencies, learning styles, characteristics, and preferences, offering a more comprehensive pedagogical approach (Pokrivčáková, 2019). Thus, the combination of AI and computer technologies bears the potential to provide L2 learners with a personalized educational experience, tailoring instruction to individual students in accordance with their distinctive traits and capabilities.

Pokrivčáková (2019) posited a taxonomy of eight fundamental manifestations of AI in language acquisition: 1) the development of personalized language learning content catering to individual needs and progress, facilitated by adaptive educational systems perpetually calibrated via data-driven adjustments, 2) the application of machine translation tools, leveraging Neural Machine Translation methodologies, 3) provision of Writing Assistants to bolster writing skills, 4) deployment of chatbots for honing conversational abilities, 5) integration of AI-powered digital language learning platforms and applications, 6) instantiation of Intelligent Tutoring as a viable alternative to traditional one-on-one instruction, 7) construction of adaptive frameworks to support collaborative learning, and 8) implementation of Intelligent Virtual Reality systems to cultivate an immersive and authentic learning context. This multifaceted paradigm embodies a profusion of prospects poised to progressively infiltrate myriad dimensions of language acquisition.

Recent AI implementations harness the data storage and analytical capabilities to glean insights from students' learning experiences, in turn, enhancing and customizing the educational milieu for each individual and context. Through optimization

techniques mirroring natural processes, AI possesses the potential to accommodate learners who perceive the technological facet of education as comparatively rigid, not congruent with their distinctive preferences and requisite (Kurilovas et al., 2015). Despite the ongoing need for continued research and the formulation of policies, particularly concerning data safety, diverse AI modalities have already demonstrated successful efficacy in education. The applications of AI in language learning span the entire spectrum of language education, encompassing not only the perspectives of learners and educators but also the administrative systems employed within educational institutions, facilitating student management and support. Proficiency in all fundamental language domains - reading, writing, listening, and speaking - stands to be augmented by AI interventions. By harnessing the transformative potential of AI, the prospect of tailoring the language learning experience to the idiosyncratic profiles of individual students becomes increasingly attainable.

The present research sets out to demonstrate the development of AI-assisted language learning research in the past two decades, identifying the main research foci and AI applications in L2 language learning.

2 Descriptive analysis and findings

2.1 Evolution of AI application in language education

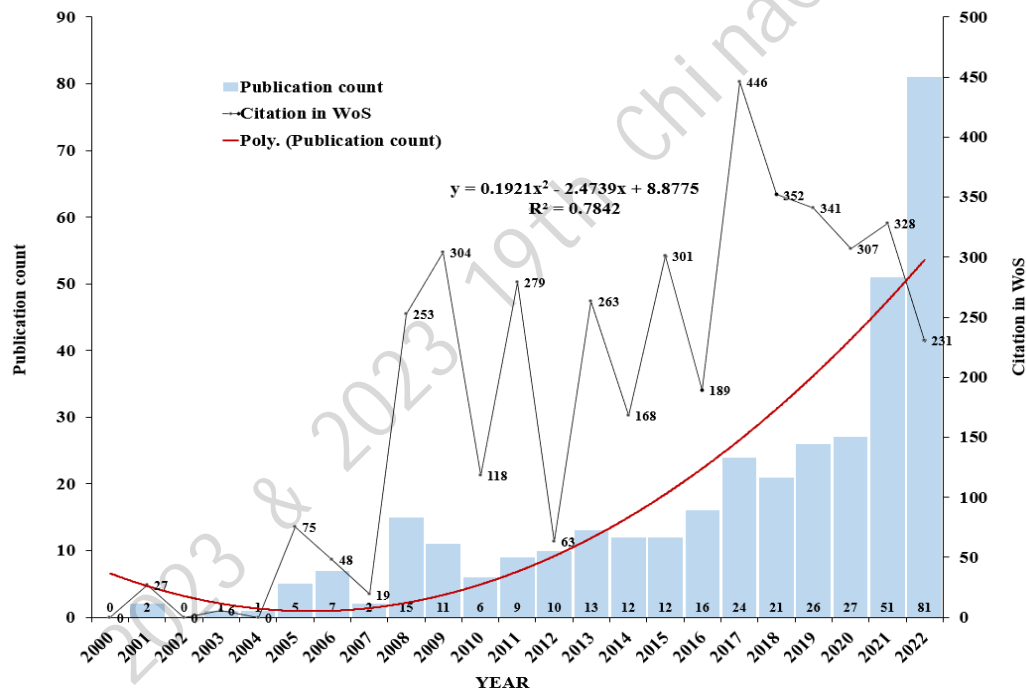


Figure 1. Year-by-year number of AI in L2 learning publications

Figure 1 presents the number of publications and their cumulative citations within WoS from 2000 and 2022, indicating an overall increasing tendency of researchers' interest, especially from 2017. The rationale underpinning this escalating trend is plausibly attributed to the advancements achieved in the domain of Natural Language Processing (NLP), which has developed from the "embryonic stage" in 2015 to the "expectation expansion stage" in 2016 (Liu & Duffy, 2023). The latest advancements in Natural Language Processing (NLP) models, exemplified by cutting-edge implementations like the Pre-trained Transformer, notably the OpenAI GPT model (Radford et al., 2018), renowned for its unidirectional linguistic prowess, and the

Bidirectional Encoder Representations from Transformers (BERT) model (Devlin et al., 2019), have largely improved the efficacy and precision of language processing. These pioneering developments have not only elevated AI technologies to the next level but also have opened a new era of AI-powered language learning.

Another explanation for the rapid growth of this research field might be due to the outbreak of COVID-19, which urged traditional pedagogy to transform into blended or even fully online teaching in some cases (Adedoyin & Soykan, 2023). AI applications, such as chatbots, intelligent tutoring system, and automatic writing and speech assessment meets the needs of L2 learners in both formal and informal contexts.

2.2 Primary publication sources

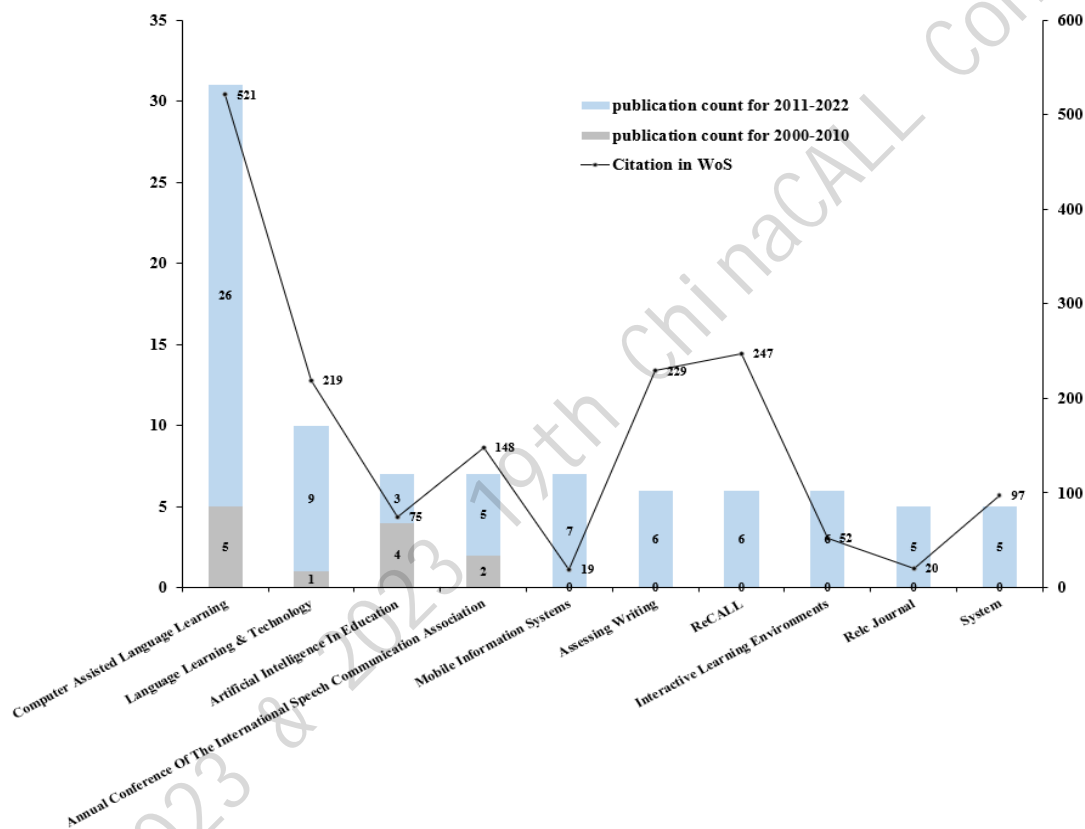


Figure 2. The top 10 contributing journals

In total, 178 publication sources were identified, with the top 10 ranked by publications (Figure 2) contributing to 27% of the total publications. Nine out of them were journals and one was a conference, with *Computer Assisted Language Learning* at the top with 31 publications and 521 citations in WoS, followed by *Language Learning & Technology*, and *Artificial Intelligence in Education*. Comparing the publication numbers of the first decade with the second, it is evident that there was an increasing scholarly interest towards AI in L2 learning in the latter. It can also be seen that these journals come from different fields, such as educational technology, applied linguistics, and computer science, indicating the multidisciplinary nature of AI and language learning studies; these results support Chen et al., (2022) and Tang et al., (2023), who pointed out that the research of AI in education is closely related to computer science.

2.3 Top countries/regions and academic collaboration

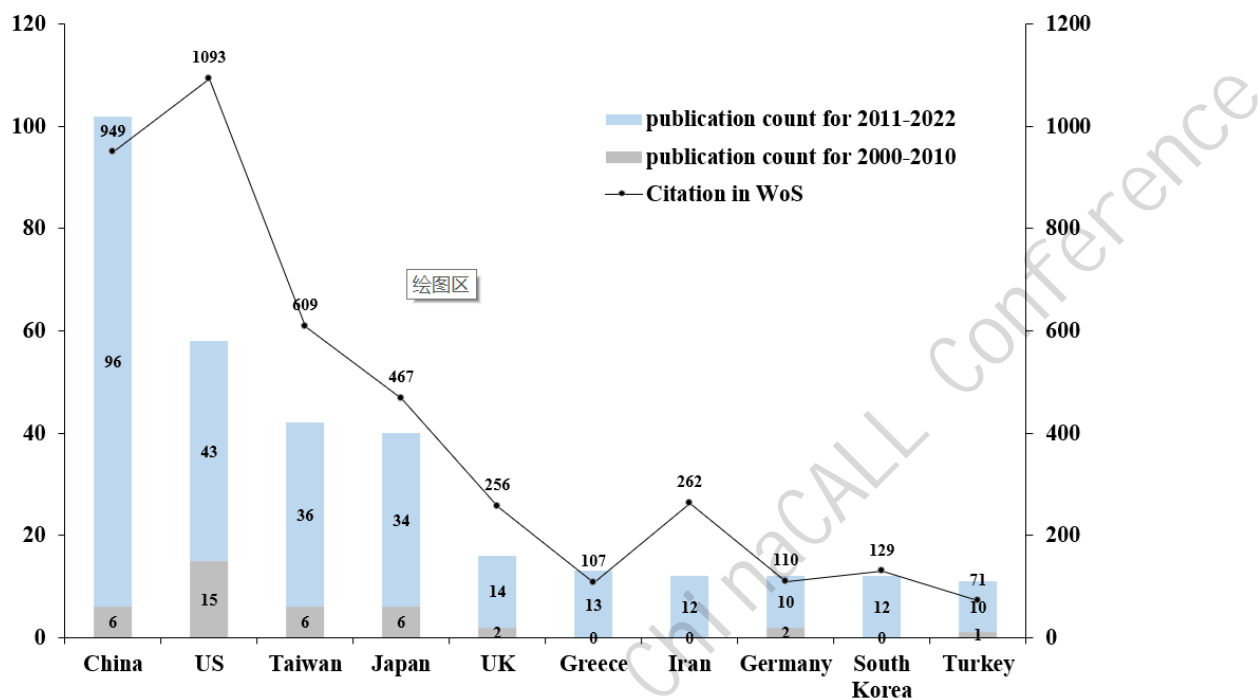


Figure 3. The top 10 contributing institutions

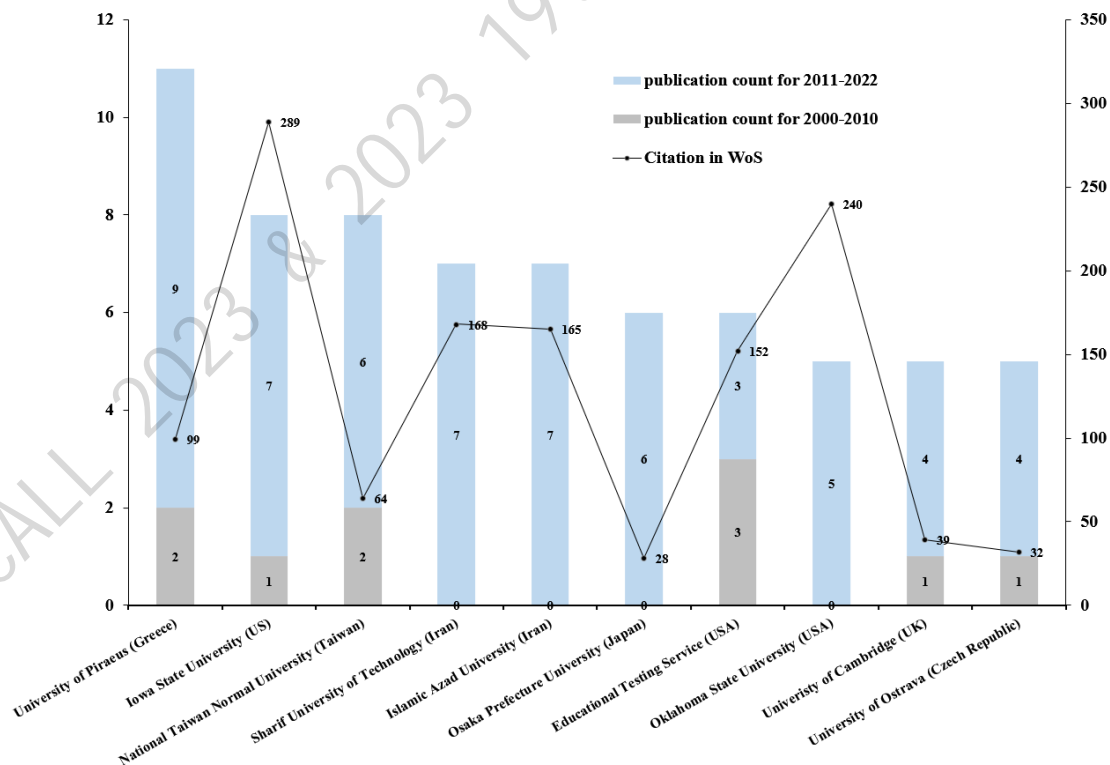


Figure 4. The top 10 contributing institutions

In total, 52 countries/regions were identified, with the top 10 ranked by publications (Figure 3). China was at the top with 112 publications, 949 citations. Other important

countries/regions include US, Taiwan, and Japan. The increasing publications in these countries/regions might be partially attributed to their governments' endeavors to promote technology-enhanced education in general by means of policy-making and financial support, as suggested by (X. Chen et al., 2020).

We identified 405 institutions and presented the top 10 in Figure 4, with University of Piraeus, Iowa State University, and National Taiwan Normal University occupying the top three positions. Most countries/regions and institutions became increasingly interested in AI and L2 learning over the period.

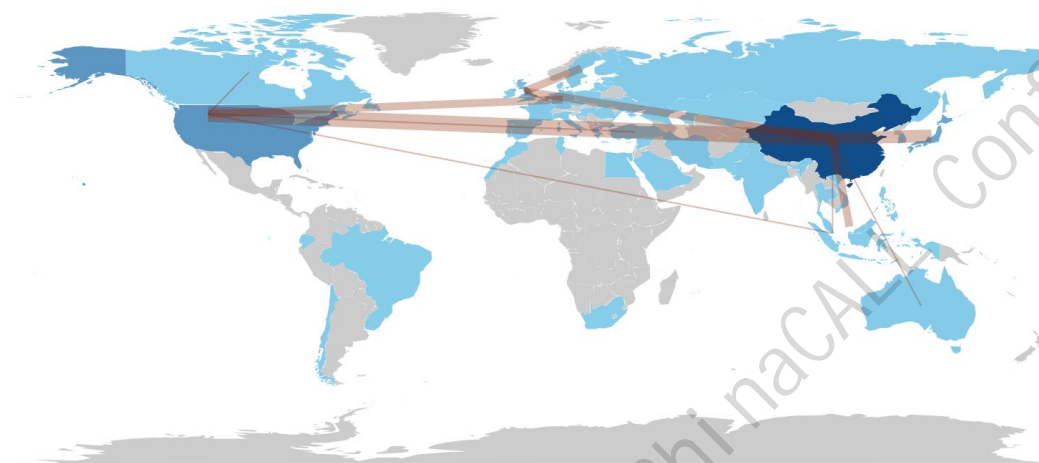


Figure 5. Country's scientific collaboration map

Figure 5 shows the global cooperation path. The blue color on the map represents the existence of research network with other nations. China, US, Taiwan, and Japan were the most collaborative countries, with China and US being the closest partners. It is interesting to note that the countries/regions with higher partnership rates showed higher research productivity and wider influence, suggesting that shared information and collaboration is important for us to better tackle with challenges as this research field advances.

2.4 Keywords of AI-assisted L2 learning research

Table 1. The top 15 commonly used keywords

No.	Keyword	Recs	Citation
1	Assessment	49	576
2	Automated writing evaluation	37	582
3	Computer-assisted language learning (CALL)	36	628
4	Intelligent tutoring systems (ITS)	36	410
5	Natural language processing (NPL)	29	220
6	Machine learning	27	174
7	L2 writing	25	682
8	Virtual & augmented reality (VR & AR)	25	242
9	Neural networks	24	288
10	Chatbot	23	468
11	Robot-Assisted Language Learning (RALL)	19	421
12	Automated Speech Recognition (ASR)	17	92
13	Conversational agent	14	167
14	Deep learning	13	85
15	English as a foreign language (EFL)	12	379

Table 1 presents a succinct overview of the top 15 frequently employed keywords, accompanied by their corresponding frequency of occurrence within our database, as well as their citations within the WoS with respect to associated publications. To illustrate, the most prevalent keyword, "Assessment," features prominently in 49 publications, with 576 cumulative citations within WoS. A discernible pattern emerges from the predominance of keywords like "Assessment" and "Automated writing evaluation," indicative of a prominent focus on AI-assisted language proficiency evaluation, particularly within the realm L2 writing and speaking. Additional thematic areas, including Intelligent Tutoring Systems (ITS) and Virtual Reality (VR) and Augmented Reality (AR)-augmented language learning, have also garnered considerable scholarly interest within L2 research.

When scrutinizing the technological underpinnings, it becomes evident that Natural Language Processing (NLP), particularly harnessed through machine learning, specifically neural network algorithms, constitutes the principal computational techniques bolstering AI applications, exemplified by the pervasive integration of chatbots within language education. It is worth noting, however, that the prevailing language of focus has been English, reflecting a certain bias within the field. This observation underscores the potential avenue for future research endeavors to extend their purview to encompass a more diverse linguistic panorama, duly acknowledging the significance of other languages.

3 Document co-citation analysis Conclusion

Document co-citation analysis (DCA), a widely-adopted scientific mapping approach in bibliometric review (C. Chen et al., 2010), examines the connection between documents co-cited by the publications. That is, DCA analyses the network established by "references" of the articles in the database. Compared with other co-citation techniques, e.g., author co-citation, this method can provide more specific information because it explores the relationships between specific cited references and thus offers more details for interpretation (Hou et al., 2018).

The DCA analysis was performed by Citespace (version 6.2.R2; C. Chen, 2006). Citespace aims to discover the conceptual and intellectual evolution of the research field by exploring development patterns and trends. The burst detection function in this software can identify highly influential publications during specific time periods, indicating intellectual turning points or pivotal points. Utilizing Citespace, we organized the publications into several thematically instinct clusters in terms of keywords. The labels of each cluster were generated by Latent Semantic Indexing (LSI) (C. Chen, 2017; Deerwester et al., 1990). The algorithm identifies labels based on the keywords of articles, i.e., publications in the database, that cite the references in each cluster.

Structural and temporal metrics were used to examine the reliability of DCA results. Structural metrics include the modularity Q index (ranging from 0 to 1), the mean silhouette (ranging from -1 to 1) and betweenness centrality scores (ranging from 0 to 1) while temporal metrics contains citation burstness. Higher modularity Q index indicates higher reliability and higher mean silhouette suggests better homogeneity of clusters. Higher betweenness centrality scores indicates that the node (a specific

publication) is important for it links different groups of nodes. Citation bursts manifest active research topics or emerging trends, characterized by a significant surge in the number of publications.

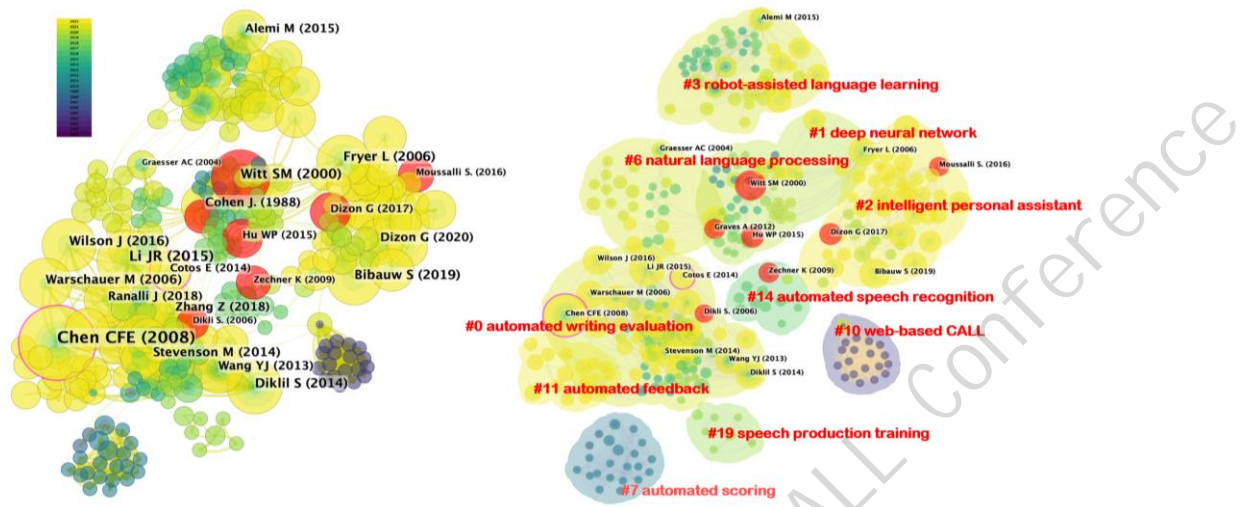


Figure 6. A landscape view of co-citation network of references cited with Modularity Q Index = 0.897 and weighted mean silhouette = 0.943. Reference view (left): references with high citations are highlighted in the figure. Each circle represents a document and the circle size represents the number of citations of the literature. The larger the circle is, the higher the citations are. Reference view (left): each circle represents a document and the circle size represents the number of citations of the literature. The larger the circle is, the higher the citations are. The line between the two documents indicates that there is a co-citation relationship between them. The red circles represent reference burst. Cluster view (right): each # represents a cluster.

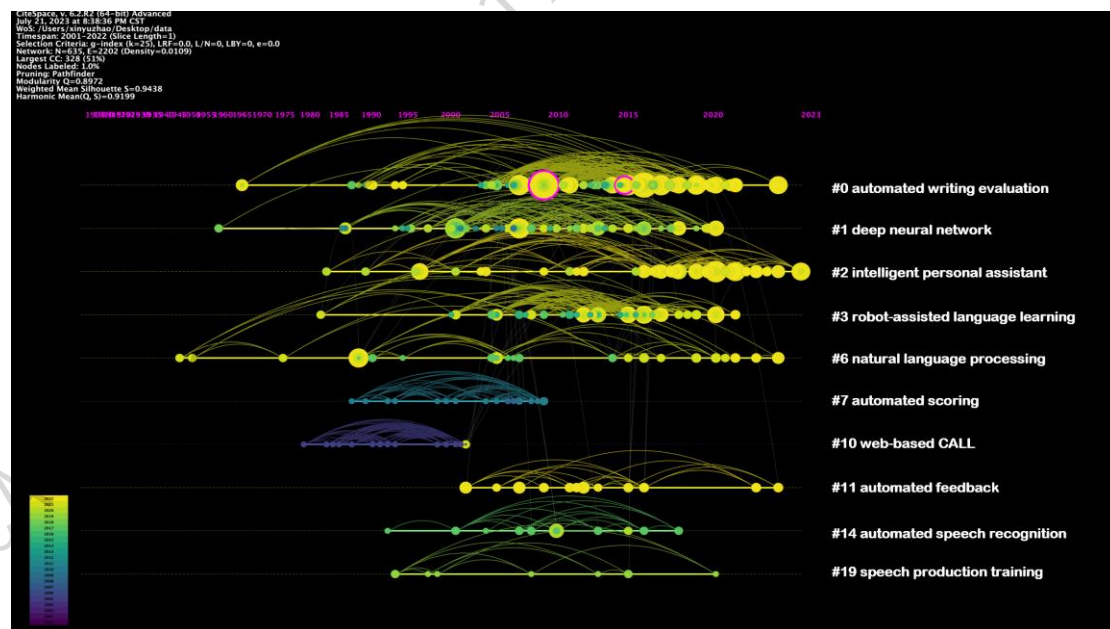


Figure 7. A timeline view from left (1970) to right (2022) with Modularity Q Index = 0.897 and weighted mean silhouette = 0.943.

The 9,396 references (from 1970 to 2022) cited by 352 documents in our database were loaded in the Citespace and the resultant co-citation network with 635 nodes and 2202 edges (links) was constructed. The network has a modularity of 0.897, which is

considered as very high, indicating that the specialties in science mapping are clearly defined in terms of co-citation clusters (C. Chen, 2017). In total, 10 clusters were identified. The smaller the cluster number, the larger the size of the cluster. Figure 6 shows the landscape view of the cited references and clusters while Figure 7 presents the corresponding timeline view. The timeline view depicts the development of each cluster chronologically, offering a more direct and clear insight into the evolutionary path of AI-assisted L2 learning studies over the period.

Accordingly, several main applications of AI in L2 learning were found as following:

AI-assisted L2 writing

Utilizing artificial intelligence (AI), student writing assistance has been advanced through the integration of Automated Writing Evaluation (AWE) systems and Intelligent Tutoring Systems (ITS). These innovative frameworks employ Natural Language Processing (NLP) techniques to assess students' written compositions, offering both diagnostic insights and constructive commentary to address language errors comprehensively. Lee et al. (2015) introduced the Genie Tutor, a correction system tailored to enhance English writing proficiency. By adeptly identifying grammatical inaccuracies and suggesting suitable linguistic expressions, this system guided learners in real-time error rectification, thus proving invaluable for language skill refinement. Furthermore, Lin et al. (2017) pioneered an ITS named EJP-Write, specifically tailored for facilitating academic journal writing endeavors. This system, equipped with a repertoire of functionalities, including reference citation and template retrieval, effectively furnished students with phraseological and paragraphal templates. These resources played an instrumental role in augmenting language precision and fluency, enhancing the overall quality of the scholarly discourse. In a pedagogical context, these AI-driven systems exemplify a paradigm shift in educational support, fostering dynamic engagement with language proficiency and scholarly communication.

AI-assisted L2 reading

The utilization of ITS extended to the realm of augmenting reading comprehension abilities in language learners. An illustrative case is the work of Johnson et al. (2017), wherein they devised an ITS named Interactive Strategy Training for Active Reading and Thinking (iSTART) targeted at adult literacy learners. iSTART presented instructional videos and exercises aimed at imparting effective comprehension strategies. Furthermore, it furnished guidance on summarization techniques and introduced interactive narratives for learners to engage with. The findings of this study indicated that learners exhibited favorable attitudes towards the interactive narratives.

Another noteworthy instance pertains to the research conducted by Wijekumar et al. (2017), wherein they designed an ITS termed as the Structure Strategy Training System (ITSS) with the goal of enhancing reading comprehension. The ITSS facilitated students in identifying pertinent text structures and offered supportive hints and feedback within an assessment framework. The outcomes demonstrated a significant performance advantage for students who availed themselves of the ITS, as it played a crucial role in organizing textual information effectively.

On the other hand, the characteristic of "readability" encompasses the quality of a text being simple and approachable. In the context of second language learning, readability assumes paramount importance as it significantly influences student progress and engagement. Artificial Intelligence (AI) has been employed to aid educators in selecting the most appropriate texts for individual learners based on their knowledge level. One illustrative AI-based tool, known as ReaderBench (Dascalu et al., 2013), is tailored to primary school learners. This tool equips both teachers and students with valuable insights concerning textual difficulty, suitable text choices, and the learner's own reflections on their progress as expressed verbally in their texts. Moreover, ReaderBench offers an evaluation of students' reading approaches.

The underlying "readability formula" for both English and French languages leverages a Support Vector Machine (François & Fairon, 2012). By employing a combination of predictors within a learning algorithm, encompassing lexical, syntactic, semantic, and context-specific variables pertinent to French as a Foreign Language, the model proves to be well-suited for assessing the readability of a substantial number of carefully curated texts. The successful application of this model enhances the efficacy of evaluating the readability of diverse texts within language learning contexts.

AI-assisted L2 speaking

Ayedoun et al. (2019) undertook a pioneering study aimed at fostering effective communication through the development of a conversational agent. This AI-based agent was meticulously designed to incorporate communication strategies and affective backchannels. The system facilitated language learners in honing their conversation skills through interactive question-and-answer sessions with the AI agent. Participants could practice and improve their speaking abilities, thereby augmenting their overall communicative competence. In the work by W. Lewis & Johnson (2010), learners engaged in a gamified approach to enhance their speaking skills. The study introduced two distinct games, namely, the Arcade and Mission games. Within the Arcade Game, players were required to deliver spoken commands to control their avatars' movements, while in the Mission game, participants assumed the role of their avatars and communicated on their behalf to accomplish specified missions. These games seamlessly integrated Automatic Speech Recognition (ASR) techniques, enabling learners to interact with non-player characters (NPC) and practice their speaking and listening abilities. The outcomes of these immersive language learning experiences were overwhelmingly positive. The majority of participants reported substantial progress in acquiring functional language abilities in the target language, signifying the efficacy of these AI-driven language learning approaches.

In a recent experimental endeavor, a novel pronunciation training method was introduced, which offers the advantage of evaluation through machine learning techniques (Jiang et al., 2021). This innovative approach holds promising potential for enhanced language learning, particularly in terms of refining learners' pronunciation skills. Moreover, the widespread availability and accessibility of computers and mobile phones have opened up new avenues for foreign language practice both within and beyond the confines of the traditional classroom setting.

The integration of automated speech recognition (ASR) technology has proven to be instrumental in facilitating language learners' progress. With the aid of ASR, learners now have the opportunity to receive automated spoken feedback on their pronunciation and speaking proficiency. This real-time feedback mechanism provides invaluable assistance to learners, enabling them to track their progress and make necessary improvements. As a result, language learners can engage in more effective and autonomous language practice, harnessing the power of technology to enhance their language skills significantly.

4 opportunities and challenges

4.1. Advantages of AI in Language Learning

AI offers personalized learning experiences tailored to individual learners through advanced algorithms. Pandarova et al. (2019) demonstrated effective grammar content adjustments for self-paced learning and improved outcomes. Chen et al. (2006) introduced a Personalized Intelligent Mobile System (PIMS) for enhanced reading development, reducing cognitive overload by aligning content with learners' proficiency.

Also, AI-driven feedback systems, like AWE, facilitate immediate adjustments by detecting errors. Khatun & Miwa (2016) exemplified such adjustments in the Bengali Handwriting Education System, enhancing language proficiency. Gierl et al. (2014) highlighted AI-based formative feedback's benefits, enabling continuous learning adaptation, surpassing teachers' preference for summative feedback.

Finally, AI-driven ITS offer learners flexibility and opportunities to practice anytime, anywhere, particularly mobile-based ITS. Additionally, Mirzaei et al. (2018) demonstrated Virtual Reality Conversation Envisioning, providing immersive language practice scenarios without geographical constraints. AI in language learning fosters dynamic engagement, breaking barriers to extensive language practice.

4.2. challenges of AI in Language Learning

Despite AI's demonstrated effectiveness in language learning, concerns persist regarding its reliability. Grimes & Warschauer (2010) expressed doubts about the accuracy of Automated Writing Evaluation (AWE) systems, especially in evaluating subjective features of natural languages. Computational semantic analysis tends to focus on denotative meanings, potentially neglecting connotative meanings, leading to inadequate assessment of authors' intentions and improper essay grading. Similarly, Johnson (2007) highlighted challenges in assessing the accuracy of Automated Speech Recognition (ASR) systems, causing variations in ASR performance across contexts that may impact interactions between students and AI systems, affecting learning effectiveness. Addressing this challenge requires advanced AI technology and comprehensive system testing before implementation.

The uncertain effectiveness of AI in language education may stem from teachers' and students' reluctance to embrace the technology. Negative experiences, such as confusing feedback from writing systems, can discourage its use. Additionally, limited experience with e-learning tools can lead to lower satisfaction with Intelligent

Tutoring Systems (ITS) and negative perceptions of AI compared to traditional technology. To promote acceptance, developers should prioritize creating AI-enhanced learning systems that deliver superior teaching and learning experiences, fostering positive attitudes. Moreover, implementing teacher training programs can help educators understand the potential benefits of AI in language education.

Conclusion

The presented survey of the latest developments in language learning through AI demonstrates the vast range of implementations and advantages AI offers to language learners. AI's applications encompass all language learning aspects, including listening, speaking, reading, and writing. Some of the key advantages of AI in language learning include providing detailed feedback to both students and teachers, creating an informal learning context that reduces language learning-related stress, and serving as a motivational tool for students. Its portability and flexibility further enhance its appeal and usability.

While AI shows promise in language education, there is room for improvement and the adoption of effective policies to optimize the learner experience and learning outcomes. As AI continues to integrate into language learning contexts, researchers must focus on addressing pedagogical issues and enhancing the overall learning experience while ensuring user-friendliness. Adequate training of future foreign language teachers in existing AI technologies is vital to effectively leverage these tools and improve language instruction. Simultaneously, efforts to reduce the cost of AI-powered tools will enhance accessibility and utilization.

Emphasizing mental health in students, this new AI-powered concept could contribute to a positive transformation in education as a whole. By harnessing the potential of AI in language learning, educators can create more personalized and engaging learning experiences that foster improved mental well-being and overall student success. As the field continues to evolve, a collaborative effort involving researchers, educators, policymakers, and technology developers is essential to unlock the full potential of AI in foreign language learning and education.


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The Implementations of the Synonymy and Antonymy for L2

Vocabulary Learning and Teaching

Introduction

It is true that without grammar, very little can be conveyed. Without vocabulary, nothing can be conveyed (Wilkins, 1972, p. 111). Word meanings are defined through the sense relations they have with other words, so the mind can make sense of them (Carter, 2012, pp. 32-33). Syntagmatic and paradigmatic relations, often referred to as 'axes', are two sense relations which exist among words (Hedge, 2000, p. 113). Syntagmatic relations, represented by a horizontal axis, are sequential relationships where word relations co-occur with high frequency, like 'a long road', 'strong tea', and 'a ripe banana', namely collocations (Hedge, 2000, pp. 113-114). Carter (1998) defines 'collocations' as a term to describe a group of grammatical or lexical words which occur repeatedly in a language (p. 53). Different from syntagmatic relations, paradigmatic relations, represented by a vertical axis, have complex relationships with other words in the network of meanings, on the categorisation and naming of these relationships, which are debated by linguists (Hedge, 2000, pp. 113-115). Generally, 'paradigmatic relations' refers to words becoming related when there can be chosen alternatives in a 'slot' in a sentence or clause. They are best visualised vertically. For example, the slot in the sentence, 'Mary is ...' can be 'beautiful', 'gorgeous' and 'attractive'. The senses of words like 'beautiful', 'gorgeous' and 'attractive' are similar in meaning, which is a specific kind of paradigmatic relation, synonymy. Synonymy is to be further explained in the next part. There are some more specific relationships which can be categorised into

paradigmatic relationships like the other most common one, antonymy (Hedge, 2000, p. 115).

Antonymy is to be explained in the next part.

On the one hand, among words relations, paradigmatic relations are so complex that they could puzzle students when they learn vocabulary. On the other hand, we can take advantage of the sense relations to teach vocabulary. For example, sense relations can help teachers elicit word meaning from students, which is a better way of vocabulary teaching. This is because elicitation can also stimulate student cognitive thinking by relating meaning stored in their mind to new meaning they are going to learn. This echoes to the idea of Hedge (2000), that if students relate the word to existing knowledge, then the memory traces become more permanent, since they learn words from surface-level activity, based on the sound and visual image of a word to a deeper level of meaning (p. 121). Therefore, it is important for teachers and students to research the most common words relations in L2 (second language) vocabulary learning and teaching.

This essay intends to research into the commonest paradigmatic relations, including the synonymy and antonymy which can be applied to L2 vocabulary learning and teaching. Prior to this, the literature review will be examined separately, from two aspects 1) the definitions and features of the synonymy and antonymy 2) the usefulness and difficulties of the synonymy and antonymy for L2 vocabulary learning and teaching. After this, some of the examples from published learning materials, and the corpus tool, Sketch Engine, will be used to look at how to take advantage of usefulness and overcome the difficulties of the word relations for L2 vocabulary

learning and teaching. The examples will be demonstrated for certain levels of students with reference to CEFR (Common European Framework of Reference) (see Appendix 1) in specific teaching contexts. Finally, the good ways of implementation of specific paradigmatic relations for L2 vocabulary learning and teaching will be summarised.

Literature review

1. Synonymy

1.1 Definition and features

If two words both mean the same thing, they are synonyms, like truck and lorry, but it is extraordinarily rare for people to find synonyms which mean the same thing and can replace each other in absolutely any sentence (Laurie, 1998, p. 30). For example, although synonyms like 'perhaps' and 'maybe' have similar meanings, they are different in style, since 'perhaps' instead of 'maybe' tends to be used in academic writing. This rare match is also stated by Hedge (2000) who defines synonyms in a given context. The complete definition is that one linguistic item can be exchanged for another without changing the meaning of the sentence or utterance in a given context, for example 'courteously' and 'politely' (Hedge, 2000, p. 115). He (2000) adds that words are not substitutable in all contexts so it is hard to find synonyms (p. 115). Being similar to the two definitions, Carter (2012) also stresses that synonyms

do not be totally interchangeable in all contexts either (p. 34). He defines (2012) synonymy as a bilateral or symmetrical sense relation where more than one linguistic form can be said to have same conceptual or propositional meaning (p. 34). Although the meaning of synonyms depends on the context, being changeable, there are still factors like dialect ('barm', 'bap'), style ('officious', 'bossy') which can help learners and teachers distinguish between synonyms (Laurie, 1998, p. 30). Other factors also offer assistance, like intensity ('shout', 'bellow'), positive and negative connotation ('mean', 'thrifty'), technicality ('spit', 'saliva') and the relationship of speaker and listener ('chochoo', 'train').

1.2 the Use of Synonymy for L2 vocabulary learning and teaching

Usefulness

It is useful for learners at early levels to learn vocabulary through similarities, especially for adult learners returning to study, who have varying language resources to help them relate words they already know when they come to knowing a new word (Hedge, 2000, p. 115). Besides, these learners only begin to learn basic words and their simplest meaning, which would be less likely to confuse them. That is to say teachers can use the sense relation(synonymy), to activate student schemata. In this case, schemata are mental representations of or prior knowledge of words which have

a similar sense to the new word (Cook, 1997, p. 86). There are examples of teachers who elicit new word meanings from students, which is found in Hedge (2000, p. 115):

“Depressed, ...what does this mean? ... yes, he’s unhappy, he’s sad, look at the picture...he’s ...yes...miserable, he’s depressed.”

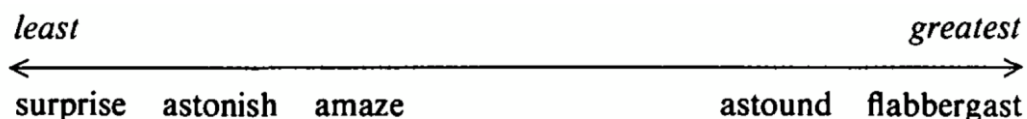
Besides, teaching synonyms with writing can help students learn L2 vocabulary, from recognition to production. This is because teaching synonyms can help higher level students solve the problem of repetitious writing (Hedge, 2000, p. 115). In turn, when they use synonyms in their writing, their L2 vocabulary learning is promoted. To be more specific, teachers can teach synonyms like ‘questions’, ‘matters’, ‘concerns’ and ‘issues’ to help B2 level Chinese students complete IELTS (International English Language Testing System), Task 2. When they write with a reason using these synonyms, they are more willing to use the word. Thus, they can strengthen their memory if students have already mastered synonyms they write, or they will find out what synonyms they had not mastered and possibly check out the meaning by using tools like vocabulary dictionaries.

Difficulties

Confused learning of related words (synonyms) is rampant (Lindstromberg, 1985, p. 239), since synonyms are defined in contexts, which has been indicated in the definitions. Chang and Zhang (2018) also remark that synonymy is developed via their juxtaposition with other words and their environments (p. 446).

A better way of teaching synonyms is recommended by Akbarian (2010), which would be teaching learners synonyms in context, like teaching vocabulary integrated into reading and concordance lines to read (p. 244). This is because teaching words in reading provides contextual clues for using the vocabulary (Kruse, 1979, p. 209). Using readings to teach vocabulary is suitable for any level of students, if the reading materials are linguistically assessible. C1 or higher levels of students can be given concordance lines to read, cited from the Sketch engine concordance tool. Concordance function allows students to search for particular words in context. Besides, teachers can sort and organise concordance according to words which typically appear either side of the lexical chunk so it helps us identify the difference in the juxtaposition of the synonyms. Since concordance lines present words in the context of a text, it will provide support and reduce interference, which can help students recognise differences between synonyms (Hedge, 2000, p. 120).

Another better way is to apply semantic theory to help B2 or higher-level students to take notes of synonyms and to help teachers teach synonyms. Semantic theory is a concept of laying out synonyms according to factors like intensity and style that help us distinguish them. There is an example cited from Channel (1981, p. 119):



Being Surprised (see grids in page 8)

	affect with wonder	because unexpected	because difficult to believe	so as to cause confusion	so as to leave helpless to act or think
surprise	+	+			
astonish	+		+		
amaze	+			+	
astound	+				+
flabbergast	+				+

However, it should be noted that although teachers teach students more than the isolated meanings of synonyms, they should also inform students that this kind of grid and scale cannot represent everything which a native speaker knows about the synonyms (Channel,1981, P. 119). Besides, there are variations between native speaker judgement about the synonyms for example, the judgement regarding ‘to what extent being surprised’ is ‘astound’ (Channel,1981).

2. Antonymy

2.1 Definition and Features

Definitions

Antonyms are generally adjectives and sometimes verbs which are divided across some conceptual domain into two mutually exclusive compartments (Cruse, 1986, p. 198). This is agreed by the synonymy definition from Laurie (1998), Hedge (2000) and Carter (2012). From the definition, it can be seen that the majority of antonyms are adjectives such as 'single' and 'married'. There are still some verb antonyms, for example 'like' and 'dislike'.

Features

Being complementary, converse, incompatible and gradable are four features of some of the synonyms (Carter, 2012, p. 34).

- 1) Complementarity is used for oppositions such as 'male' and 'female' and 'dead' and 'alive' as there are clear-cut; one excludes the other (Hedge, 2000, p. 115), which echoes to idea of complementarity put forward by Carter (2012). This type of antonymy cannot be gradable so we cannot say 'the girl is slightly dead' unless people want to make a joke.
- 2) Converseness is a relationship where one term implies the other, such as 'import' and 'export', 'parent' and 'child', and 'trainer' and 'trainee' (Hedge, 2000, p. 115). This feature is defined by Carter (2012) as a contrastive lexical relation where there is a measure of logical reciprocity (p. 34).

- 3) Incompatibility is a relational contrast between items in a semantic field or a topic (Carter, 2012, p. 34). If the topic is animal, the ‘dog’ and ‘cat’ are antonyms (Laurie, 1998). The same idea is true for the topic of colour. In this case, ‘yellow’ and ‘red’ are antonyms.
- 4) Gradable antonyms are often culturally defined. As Hedge (2000) said, they may relate to the learner’s first language (p. 115). For example, ‘tall’ and ‘short’ need a norm to define them. To be more specific, what defines ‘tall’ is decided by people who are influenced by different cultures or people living in different areas. Since this kind of antonym can be graded, the scale of this type of words had a neutral area where neither antonym fits. It is possible to speak of it is neither long or short, referring to this neutral area.

2.2 The Use of Antonymy for L2 vocabulary learning and teaching

Usefulness

Just like the implementation of synonym theories, antonymy teaching can also use schemata teaching by using sense relations of antonymy for A1 to B1 learners. This is because they just know the basic words and meanings such as ‘like’ and ‘dislike’, ‘simple’ and ‘difficult’ and ‘lucky’ and ‘unlucky’, and they are less likely to be confused by the word meaning (Lindstromberg, 1985). For instance, teachers can elicit the meaning of ‘dead’ by saying ‘she is not alive so she is ...’. Or, just like the example of O’Keffe (2012), the teacher can explain the meaning of ‘dark’ to students by saying it is the opposite of ‘light’ (p. 242).

For higher level of students, teachers can teach antonyms, especially with an incompatibility feature to help students with their academic writing, which in turn helps their vocabulary learning when they use these antonyms. This is because an antonym can be used in an unmarked fashion (Jones, 2002, p. 170), which helps students show the objectivity of the essay, especially when students are asked to evaluate things. For example, if students are required to write an essay about the service of the NHS (National Health Service), it is better for them to write about how well and how badly they are doing. Besides, the incompatibility feature is decided by the topic so by learning these antonyms, students are less likely to go off topic. For instance, if they know 'dog' and 'cat' are antonyms with the incompatibility feature, students would be less likely to mention cat when writing under the topic of dog.

Difficulties

Antonyms can pose pedagogical challenges because words do not always have just one antonym, such as the antonyms of 'short' can be 'tall' and 'high' (O'Keffe, 2012, p. 242). Various antonyms for one word are as such because antonyms differ in meanings, since they are used in different contexts (O'Keffe, 2012, p. 242). Take 'dry' for example; 'sweet' is the opposite of 'dry' in 'dry white wine', while 'battered' is the antonymy of 'dry' in 'dry toast'. The same things apply to 'wet' for 'dry' in 'the night was dry and 'moist' for 'dry' in 'my throat was dry'. The better way would be teaching antonyms in reading, namely in context (O'Keffe, 2012, p. 242). One way

for teachers to do this is to give students meanings of each antonym, and then students are asked to identify them in reading passages (Kruse, 1979, p. 208). Therefore, students would know the context of antonyms being used. This way of teaching suits for any level of students but this way would require teachers find appropriate materials for students and teaching environment. If there is not enough classroom time, the reading can be given as an assignment for students. Concordance lines can also be used in antonymy teaching, since vocabularies are taught in contexts.

Implementations

1. The Use of Elicitation

From the literature review we know that, for lower levels of students (A1-B1), teachers can elicit new word meanings from similar and opposite meanings of what students know (Lindstromberg, 1985). This passage, on personality, (See Appendix 2) is used by 15 B1 level Chinese students of more than 25 years old who learn English for work. They are studying in a private institution. According to the CEFR, these students can only deal with simple English and familiar topics like travel, personal interest and dreams (Person Longman, 2000, p. 5). Previously, for their compulsory education period, these students lived and studied in a remote area in Gulin County, LuZhou which is in the South Eastern part of China. Their vocabulary learning method is by rote memorisation.

The topic of this passage is about two personalities, introverts and extroverts. Obviously, teachers can ask students to brainstorm and discuss personalities they know, in order to stimulate their schemata to get them prepared to read. Although they do not know 'introvert' and 'extroverts', they would know 'shy' and 'quiet' and 'outgoing' and 'active'. Teachers can simply elicit

'introvert' meaning by saying, 'introvert', what does 'introvert' mean? ... yes, she is shy, she is not active, so she is ... quiet, 'not outgoing', she is an introvert. In this way, students will relate their familiar words 'quiet, 'not active', 'not outgoing' and 'shy' with 'introvert', which will stimulate their cognitive thinking and be more interesting than meaningless repetitions (Hedge, 2000). The same thing can also apply to another word, 'extrovert'.

2. The Use of Reading, Semantic Theory, and Concordance Lines

According to the literature, for higher levels of students (B2-C2), teachers can use reading and concordance lines to teach synonyms, as suggested by Akbarian (2009, p. 244) and antonyms in context follow the advice of O'Keffe (2012, p. 242). It is also useful to use semantic theory to help students make grids and scales because this way presents more than isolated meanings (Channel, 1981, p. 119).

2.1 The use of teaching synonyms and antonyms integrated into reading

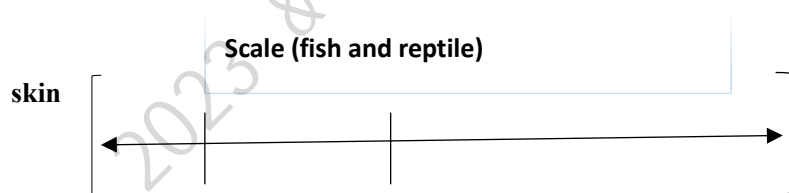
The material, Snake Sneaks into Auckland Suburb (see Appendix 3), is used by 15 Chinese B2-C1 students aged 17 to 19. For this level of students, they are able to read a wide range of long, demanding texts and can use English effectively and flexibly for social, academic and professional purposes (Person Longman, 2000, p. 5). These students study in a private school, in Chengdu XiChuan high school. Some of them plan to go abroad to pursue their higher education and some of them will stay in China for their higher education. They all live in the centre of Chengdu, the capital city of the Sichuan province. Their vocabulary learning strategy is looking up words in dictionary.

For this level of students, teachers can let students read the passage and circle the synonyms and antonyms of ‘hunt’ (‘discover’, ‘find’, ‘spot’, and ‘on the ‘loose’) and ‘harmless’ (‘poisonous’ and ‘dangerous’) and synonyms of ‘skin’ (s) (‘scales’) in the passage (see Appendix 3) and then ask them to fill in the table (see Appendix 4) by using words they found. In this way, they will find out how words are used by contextual aids, claimed by Kruse (1979, p. 209), so they will be more likely to notice the difference between synonyms and which ones are the suitable antonyms in context. For example, they will find, in context, the synonym of skin; ‘scale’ is used with fish, which is a kind of specific skin.

2.2 The Use of Semantic Theory in Differentiating Synonyms

When they finish the table, although they had gathered implicit information on how these synonyms are used, teachers can use semantic theories to show how they are different from each other by using grids and scales like the two as follows,

‘skin’ and ‘scales’



‘hunt’, ‘discover’ ‘find’ and ‘spot’

	To see where they are	To be the first time find or find out about	To notice them	To try to find them by searching carefully and
--	--------------------------	---	----------------	--

				thoroughly
find	+			
discover	+	+		
hunt	+			+
spot	+		+	

Although this teaching method cannot teach everything students should know about the synonyms 'hunt', 'discover', 'find', and 'spot', it helps students differentiate and corroborate the word meanings to some degree.

2.3 The Use of Teaching Synonyms and Antonyms with Concordance Lines

If teachers think students still cannot figure out the meaning of these synonyms and antonyms, even after teaching these synonyms and antonyms with integrated reading, and teaching synonyms by using grids and scales; teachers can give students concordance lines to read in class and as assignments to help them figure out the meaning. Take 'harmless', 'dangerous', and 'poisonous' for example (see Appendix 5). After reading the concordance lines, it is likely to be found that when 'harmless' is used with animals, it means the something does not have bad effects, especially on people's health. Take line 11 (Appendix 5 in The Concordance Lines of 'Harmless') for example. 'harmless' in 'harmless drugs' means the drug does not have bad effect on people's health, just like the meaning of 'harmless' in 'harmless variety' in the passage, Snake Sneaks into Auckland Suburb. Therefore, with the help of contextual aids for the vocabulary used in concordance lines, students will consolidate what they get from reading passages and teaching

using semantic theories.

3. The Use of Synonyms and Antonyms in Teaching Writing

As mentioned in the literature review, for higher level students, teaching synonyms can assist students with solving the problems of repetitious writing (Hedge, 2000, p. 115). Teaching antonyms can help students produce unmarked arguments and prevent students off topic to some degree. When students are taught by means of synonyms and antonyms integrated into writing, they have reasons to use these words, which will consolidate student vocabulary learning.

3.1 Teaching Synonyms in Assisting Repetitious Writing

The material (see Appendix 6, a writing task adapted from 2 Cambridge English Book IELTS 8 Test 4) is used by 15 B2 Chinese students aged 20, whose target score is 7 (C1) in writing. They study in a private institution, Chengdu NewChannel, to receive training for IELTS writing, since they all want to study in the UK for a Master's degree. All of the students are from the centre of Chengdu, the capital city of the Sichuan province.

The task asks students to analyse the causes and put forward solutions for the phenomenon of an increase in people's weight and a decrease in their health and fitness. For these students, they often repeat two words, 'reason' and 'cause' in their essay. When they finish their writing, it is useful to ask them to circle the synonyms of 'reason' in the model essay and teach them some synonyms not in the model essays like 'motive', 'incentive', 'grounds', 'impetus' and 'inducement'. However, at this stage, teachers should use the other ways mentioned to teach words in context so that students know how to use them in their essay. In this way, they not only learn these

vocabularies, but also know how to use them in the future. After that, when they produce essays using these words, their L2 vocabulary learning will be enhanced. Even if they do not use these words right, teacher corrective feedback on their work will help them know these words.

3.2 Teaching Antonyms with Helping to Produce Unmarked Statements and Focusing on the Topic

If the material in task 2 (see Appendix 7, a writing task adapted from 2 Cambridge English Book IELTS 8 Test 3) is used by the learner mentioned in 3.1, they would also benefit from learning antonyms in writing papers, which requires them to evaluate problems. When they use these words in their writing successfully, they will truly understand these antonyms. Since this material, Task 2, asks them to evaluate whether increasing the price of petrol is the best way to solve growing traffic problems or not. Therefore, it involves teaching antonyms like ‘benefits’ and ‘drawbacks’ and ‘disadvantages’ and ‘disadvantages’ to help students write their evaluation about this measure. After that, using these words in their essay successfully will truly promote their L2 vocabulary learning.

Other than that, students are required to talk about increasing petrol prices for controlling traffic problems. With the exception of words within the topic, other words are antonyms like ‘emission’, ‘environment’ and ‘pollution’, which should not be written in this task. This follows the principle of incompatibility of antonymy (Carter, 2012, p. 34). Students will tend to go off topic by relating increasing petrol price with environmental protection. Using incompatibility of antonyms can help teachers inform students how to focus on topics to some degree. Teachers can ask students to check whether the model essay contains words about environment or not, which will consolidate

their learning of antonyms.

Summary

Synonymy and antonymy being the most paradigmatic relations, are important for L2 vocabulary learning and teaching in so many aspects (Hedge, 2000). The key to teaching synonymy and antonymy is to teach vocabulary in context, which will promote L2 vocabulary learning and teaching (O’Keeffe, 2012). So, in this assignment, whether elicitation of word meaning using the two sense relations, teaching words integrated with reading, semantic theory, concordance lines, and writing, the antonymy and synonymy are not taught by presenting as a single item. With the exception of using semantic theory, this way can help students consolidate synonyms and antonyms they learn in context. Most ways of teaching synonymy and antonymy include utilising their sense relations in context, such as teaching words integrated into reading, concordance lines and writing and elicitation. This gives a lot of implicit information (how L2 vocabulary is used), which is believed to be the key to language development (Ellis, 2016, p. 3). As synonyms and antonyms are an important part of vocabulary, it is significant to use the two sense relations to teach vocabulary in the ways mentioned above by using context (Chang and Zhang, 2018).

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Appendix 1

Longman, P. (2013). Teacher's guide to the Common European Framework. *Recuperado de:*

<http://lcci.hu/hun/wp-content/uploads/cefguide.pdf>.

Common Reference Levels - The Global Scale



Proficient	C2	<ul style="list-style-type: none"> • Can understand with ease virtually everything heard or read. • Can summarize information from different spoken and written sources, reconstructing arguments and accounts in a coherent presentation. • Can express him/herself spontaneously, very fluently and precisely, differentiating finer shades of meaning even in more complex situations.
	C1	<ul style="list-style-type: none"> • Can understand a wide range of demanding, longer texts, and recognize implicit meaning. • Can express him/herself fluently and spontaneously without much obvious searching for expressions. • Can use language flexibly and effectively for social, academic and professional purposes. • Can produce clear, well-structured, detailed text on complex subjects, showing controlled use of organizational patterns, connectors and cohesive devices.
Independent	B2	<ul style="list-style-type: none"> • Can understand the main ideas of complex text on both concrete and abstract topics, including technical discussions in his/her field of specialization. • Can interact with a degree of fluency and spontaneity that makes regular interaction with native speakers quite possible without strain for either party. • Can produce clear, detailed text on a wide range of subjects and explain a viewpoint on a topical issue giving the advantages and disadvantages of various options.
	B1	<ul style="list-style-type: none"> • Can understand the main points of clear standard input on familiar matters regularly encountered in work, school, leisure, etc. • Can deal with most situations likely to arise while travelling in an area where the language is spoken. • Can produce simple connected text on topics which are familiar or of personal interest. • Can describe experiences and events, dreams, hopes and ambitions and briefly give reasons and explanations for opinions and plans.
Basic	A2	<ul style="list-style-type: none"> • Can understand sentences and frequently used expressions related to areas of most immediate relevance (e.g. very basic personal and family information, shopping, local geography, employment). • Can communicate in simple and routine tasks requiring a simple and direct exchange of information on familiar and routine matters. • Can describe in simple terms aspects of his/her background, immediate environment and matters in areas of immediate need.
	A1	<ul style="list-style-type: none"> • Can understand and use familiar everyday expressions and very basic phrases aimed at the satisfaction of needs of a concrete type. • Can introduce him/herself and others and can ask and answer questions about personal details such as where he/she lives, people he/she knows and things he/she has. • Can interact in a simple way provided the other person talks slowly and clearly and is prepared to help.

The Common European Framework of Reference for Languages: Learning, Teaching, Assessment has been developed by the Language Policy Division of the Council of Europe (Strasbourg) (c) 2001 Council of Europe, Language Policy Division

READING

6 The psychiatrist Carl Jung described two personality types. Look at these adjectives and put them into two categories to show two different character types.

adventurous cautious quiet
self-confident talkative thoughtful

7a Read the encyclopedia entry about Jung quickly and check your answer to Exercise 6.

7b Are these statements true or false?

- 1 Jung studied medicine in Zürich.
- 2 He identified the following personality types: extroverts, introverts, balanced personality.
- 3 Extroverts like to be in large groups of people.
- 4 Introverts think carefully before they do things.
- 5 People are interested today in his theories on dreams.

7c Work with a partner to describe the qualities of extroverts and introverts. Do not look back at the text.

8 Which kind of personality do you think each of these jobs would attract? Why? Make notes about four of them, and then compare with a partner.

actor artist computer programmer
film director inventor journalist
librarian musician police officer
politician tax inspector teacher
writer

SPEAKING

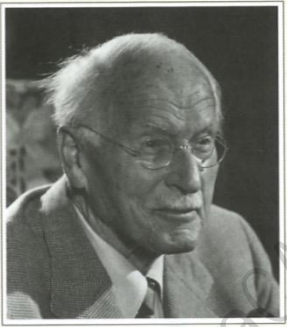
9 Work with a partner to discuss the following.

- 1 What are the advantages and disadvantages of having a strong personality?
- 2 What is a 'personality clash'? Have you had a personality clash with someone? What happened?
- 3 What tells you more about a person's personality: their appearance, their voice, their attitude or something else?

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Carl Jung



Carl Jung (1875–1961) was a Swiss psychiatrist who had a lasting influence on psychology and society. He studied medicine at the University of Basel from 1894 to 1900, specialising in psychiatric medicine.

Jung developed ideas about personality types which still interest and influence people today. He identified two personality types which he called introverts and extroverts. According to Jung, extroverts find meaning outside themselves, in the surrounding world. However, introverts are introspective. They look into themselves and find meaning in themselves.

Extroverts seem to like other people. It is easy for them to form close relationships. They enjoy the excitement of crowds. They tend to be assertive, self-confident, and are often leaders in groups. They are energetic and lead busy lives. In general, they are talkative, adventurous and sociable. Introverts, on the other hand, feel comfortable alone. They avoid large crowds. They are relaxed, thoughtful and reflect before they act. They are often quiet, cautious and have good powers of concentration. They often have creative ideas.

Jung's influence on our society and culture has been enormous. Two well-known tests (Myers-Briggs and David Keirsey) are based on his theory of personality types. His ideas have influenced writers as well as film-makers like Fellini and Kubrick. Jung's ideas have even influenced video games and rock music groups. There is still great interest in his theories on the interpretations of dreams.

[edit]

Appendix 3

Snake sneaks into Auckland suburb

- The hunt is on for a live snake which could be on the loose in Auckland. The reptile has left behind a freshly shed skin in the inner-city suburb of Freeman's Bay. Experts believe it has come from a boa or python nearly two metres long. Ten-year-old Victor McKenney found the skin near his home. "I thought it was like fish scales and then my friend pointed out it looked like snake skin." Victor said. The skin is now being tested at a site near Christchurch but experts believe it is a harmless variety and definitely still alive.
- It is not the first snake to sneak into New Zealand this year. In March a poisonous eastern brown snake was found alive in Wellington and two others were discovered dead in Auckland and Wellington.
- The Ministry of Agriculture and Fisheries is worried. Although it is not a dangerous variety, MAF points out that all reptiles could be carriers of bacteria such as salmonella. The MAF snakecatcher team will be out again with dogs in a bid to find the snake. Meanwhile, MAF is urging anyone who spots the missing snake to call 0800-809 966

Appendix 4

hunt	antonyms			
	synonyms			
harmless	antonyms			
	synonyms			
skin	synonyms			

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Appendix 5

1. Concordance Lines of 'Harmless'

Concordance | Sketch Engine 2020/4/8 10:59

simple harmless 30 > sample 30 30 x > sample 30 30 (0.27 per million) x |

Sort word, word, word x

Details Left context KWIC Right context

1	<input type="checkbox"/>		Written books and ... was dropping heavily down on me - harmless , but repulsively slimy and smelling li
2	<input type="checkbox"/>		Written books and ... </s><s> Not only was I indulging a harmless pleasure, I was also doing her kids a
3	<input type="checkbox"/>		Written books and ... ad the view that sociolinguistics is a harmless activity like butterfly-collecting, but th
4	<input type="checkbox"/>		Written books and ... <s> For Assiter, fantasy is not just a harmless and essentially solitary activity in whi
5	<input type="checkbox"/>		Written books and </s><s> So don't treat it as if it's a harmless filler. </s><s> Like Mexican cuisine,
6	<input type="checkbox"/>		Written books and ... : an example. </s><s> Lord - was a harmless man, with hardly any land, so they dr
7	<input type="checkbox"/>		Written books and ... bility for any but the most trivial and harmless of their actions: </s><s> The Indian
8	<input type="checkbox"/>		Written books and ... ism, the Universal Declaration is as harmless as it is futile. </s><s> Nonsense can
9	<input type="checkbox"/>		Written books and ... rs. </s><s> Most are thought to be harmless , but about a dozen appear to be tox
10	<input type="checkbox"/>		Written books and ... way their eyes slipped over her, but harmless . </s><s> Mostly harmless; rememb
11	<input type="checkbox"/>		Written books and ... uring and distributing comparatively harmless drugs, such as marijuana. </s><s> L
12	<input type="checkbox"/>		Written-to-be-spoken aker </s><s> I think it's completely harmless . </s><s> It's provocative. </s><s> I
13	<input type="checkbox"/>		Spoken demographic in flying saucers and a quite happy harmless , but, I think they need checking on t
14	<input type="checkbox"/>		Spoken context-go... er there mate. </s><s> Is it not just harmless fun? </s><s> Not at all. </s><s> It's
15	<input type="checkbox"/>		Written books and ... at that moment, decided on a bit of harmless menace. </s><s> 'Listen, Taig,' he s
16	<input type="checkbox"/>		Written books and ... ge purse and give everyone a bit of harmless fun, then more power to her elbow. <
17	<input type="checkbox"/>		Written books and ... ething real and so a row of perfectly harmless Brussels Sprouts were decapitated.
18	<input type="checkbox"/>		Written books and ... ombs, which despite being pretty harmless (containing about as much genuine €
19	<input type="checkbox"/>		Written books and ... ɛ was, I think, a bit simple, but quite harmless . </s><s> He'd occasionally pop dov
20	<input type="checkbox"/>		Written books and ... sinister atmosphere this hall is quite harmless . </s><s> 19. </s><s> CLOAKROOF

SORTED. JUMP TO...

<https://app.sketchengine.eu/#concordance?corpname=preloa...r30%22%7D%2C%22id%22%3A8162%2C%22active%22%3Atrue%7D%5D> 第 1 页 (共 1 页)

2. Concordance Lines of 'Poisonous'

Concordance | Sketch Engine

2020/4/8 11:01

simple poisonous 30 > sample 30 30 X > sample 30 30 (0.27 per million) X |

Sort word, word, word X

Details

Left context

KWIC

Right context

1	<input type="checkbox"/>	<input type="checkbox"/>	Written books and ... s pilots had been knocked out by a poisonous gas. </s><s> No one has been arre
2	<input type="checkbox"/>	<input type="checkbox"/>	Written books and ... landarinfish (callionymidae) have a poisonous mucus which deters predators and :
3	<input type="checkbox"/>	<input type="checkbox"/>	Written books and ... ide </s><s> Carbon monoxide is a poisonous gas which, when inhaled, limits the l
4	<input type="checkbox"/>	<input type="checkbox"/>	Written books and ... ? </s><s> A snake is necessarily a poisonous creature ,? </s><s> A knife is neces
5	<input type="checkbox"/>	<input type="checkbox"/>	Written books and ... subjected to a substantial dose of a poisonous substance. </s><s> Effects </s><s>
6	<input type="checkbox"/>	<input type="checkbox"/>	Written books and ... s> It's a snake entails neither It's a poisonous creature nor It's not a poisonous cre
7	<input type="checkbox"/>	<input type="checkbox"/>	Written books and ... y should he be subjected to such a poisonous , foul and unpleasant cocktail of sev
8	<input type="checkbox"/>	<input type="checkbox"/>	Written books and ... ked. </s><s> 'It takes more than a poisonous soda to subdue me.' </s><s> She w
9	<input type="checkbox"/>	<input type="checkbox"/>	Written books and ... had his infamous encounter with a poisonous prawn that laid him low for several c
10	<input type="checkbox"/>	<input type="checkbox"/>	Written books and ... : that they manufacture thorns, and poisonous or nasty-tasting chemicals. </s><s>
11	<input type="checkbox"/>	<input type="checkbox"/>	Written books and ... ook them free of invading ants and poisonous hairy caterpillars, and crawled from
12	<input type="checkbox"/>	<input type="checkbox"/>	Written books and ... > The work was backbreaking and poisonous , and conditions harsh. </s><s> But
13	<input type="checkbox"/>	<input type="checkbox"/>	Written books and ... s><s> Take the case of snake and poisonous creature . </s><s> It's a snake enta
14	<input type="checkbox"/>	<input type="checkbox"/>	Written books and ... o cause or knowingly to permit any poisonous , noxious or polluting matter to ente
15	<input type="checkbox"/>	<input type="checkbox"/>	Written books and ... are venomous, although some are poisonous when eaten because they accumule
16	<input type="checkbox"/>	<input type="checkbox"/>	Written books and ... eates a pollutant which is about as poisonous as, say, privet leaves, it may be hec
17	<input type="checkbox"/>	<input type="checkbox"/>	Written miscellaneo...nd the Member for Chingford being poisonous or venomous, but neither poison noi
18	<input type="checkbox"/>	<input type="checkbox"/>	Written books and ... : against being eaten by containing poisonous or sickening substances. </s><s> S
19	<input type="checkbox"/>	<input type="checkbox"/>	Written books and ... lsemium (jasmine) is an extremely poisonous plant which affects the central nervc
20	<input type="checkbox"/>	<input type="checkbox"/>	Written books and ... troleum distillates which are highly poisonous if swallowed; aspirin - one of the mc

SORTED. JUMP TO... ↻

<https://app.sketchengine.eu/#concordance?corpname=preloa...r30%22%7D%2C%22id%22%3A2849%2C%22active%22%3Atrue%7D%5D>

第 1 页 (共 1 页)

3. Concordances Lines of 'Dangerous'

Concordance | Sketch Engine 2020/4/8 11:04

simple dangerous 30 > sample 30 30 (0.27 per million) X | Sort word, word, word X ↺

Details Left context KWIC Right context

1	<input type="checkbox"/>	<input type="checkbox"/>	Written books and ... ognised as one of the hazards of a dangerous job. </s><s> Miners listened for the
2	<input type="checkbox"/>	<input type="checkbox"/>	Written books and ... <s> To the prison guards he was a dangerous criminal, but to me he was an unfort
3	<input type="checkbox"/>	<input type="checkbox"/>	Written books and ... and. </s><s> The Bonneys were a dangerous breed. </s><s> She found the rabbi
4	<input type="checkbox"/>	<input type="checkbox"/>	Written books and ... ane. </s><s> He took 'difficult and dangerous ' evasive manoeuvres. </s><s> But
5	<input type="checkbox"/>	<input type="checkbox"/>	Written books and ... t. </s><s> The Russians invite any dangerous questioners to a sumptuous feast, a
6	<input type="checkbox"/>	<input type="checkbox"/>	Written books and ... conservation is less likely to be as dangerous as the ancient quack prescribing cu
7	<input type="checkbox"/>	<input type="checkbox"/>	Written books and ... </s><s> The Ceasg is known to be dangerous and will swallow a man whole, poss
8	<input type="checkbox"/>	<input type="checkbox"/>	Written books and ... 'hirpool analogy can prove equally dangerous in its generalisation for there are inn
9	<input type="checkbox"/>	<input type="checkbox"/>	Written books and ... ing work, which was carried out in dangerous conditions. </s><s> They agreed th
10	<input type="checkbox"/>	<input type="checkbox"/>	Written books and ... lodder (1986) has showed that it is dangerous to rely upon casual observations of
11	<input type="checkbox"/>	<input type="checkbox"/>	Written books and ... m Dominica: I had not explored its dangerous magic as I ought to have done. </s>
12	<input type="checkbox"/>	<input type="checkbox"/>	Written books and ... imes was a cruel river but no more dangerous than in the seething cauldron under
13	<input type="checkbox"/>	<input type="checkbox"/>	Written books and ... ion had ever had to carry, the most dangerous traitor ever in the history of the gove
14	<input type="checkbox"/>	<input type="checkbox"/>	Written miscellaneo... ation but also to give indications of dangerous temperatures in the structure. </s><
15	<input type="checkbox"/>	<input type="checkbox"/>	Written books and ... state, </s><s> It is not addictive or dangerous .' </s><s> Yet one time evangelist c
16	<input type="checkbox"/>	<input type="checkbox"/>	Written books and ... drugs could be taking ineffective or dangerous counterfeit products without realisin
17	<input type="checkbox"/>	<input type="checkbox"/>	Written books and ... dog from straying into a potentially dangerous situation, for example if you should
18	<input type="checkbox"/>	<input type="checkbox"/>	Written books and ... oesophagus, a rare but potentially dangerous complication of variceal injection. </
19	<input type="checkbox"/>	<input type="checkbox"/>	Written books and ... fairy haunt no doubt, and probably dangerous to lone travellers. </s><s> A silvery
20	<input type="checkbox"/>	<input type="checkbox"/>	Written-to-be-spoken ef convoys in Bosnia, life is proving dangerous . </s><s> Already they've been the

SORTED. JUMP TO... ↺

<https://app.sketchengine.eu/#concordance?corpname=preloa...r30%22%7D%2C%22id%22%3A8493%2C%22active%22%3Atrue%7D%5D> 第 1 页 (共 1 页)

Appendix 6

You should spend about 40 minutes on this task.

Write about the following topic:

In some countries the average weight of people is increasing and their levels of health and fitness are decreasing.

What do you think are the causes of these problems and what measures could be taken to solve them?

Give reasons for your answer and include any relevant examples from your own knowledge or experience.

You should write at least 250 words.

Appendix 7

WRITING TASK 2

You should spend about 40 minutes on this task.

Write about the following topic:

Increasing the price of petrol is the best way to solve growing traffic problems.

To what extent do you agree or disagree?

What other measures do you think might be effective?

GLOCAL 2023 & 2023 19th ChinaCALL Conference

基于文献计量可视化方法的英语智慧课堂研究的现状分析

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摘要: 智慧课堂近年来在国内发展态势良好, 取得了丰硕的研究成果, 受到了广泛关注。本文采用文献计量学知识与可视化软件 CiteSpace, 选取 CNKI 中 2011 到 2023 年一共 13 年的主题为“英语智慧课堂”的论文进行分析, 通过探讨智慧课堂的发展趋势、发文区域、核心作者及研究热点, 呈现出近 13 年来智慧课堂在教育领域下英语课堂中的成长历程, 利于在日后的研究中发挥积极作用。

关键词: 智慧课堂; 文献计量分析; CiteSpace 可视化软件

Abstract: In recent years, wisdom classroom has developed well in China, and has achieved fruitful research results, which has attracted wide attention. By using bibliometrics knowledge and visualization software CiteSpace, this paper selects CNKI's 13 years from 2011 to 2023 with the theme of "English wisdom Classroom" for analysis, and explores the development trend, publication area, core authors and research hotspots of wisdom classroom. This paper presents the growth process of wisdom classroom in English classroom in the field of education in the past 13 years, which is conducive to play a positive role in future research.

Key words: wisdom classroom; Bibliometric analysis; CiteSpace visualization software

1. 引言

我国著名科学家钱学森在 1997 年提出大成智慧学理论; 1998 年, 美国克林顿政府提出“信息高速公路”计划; 随着教育信息化的迅猛发展, IBM 于 2008 年正式提出“智慧地球”战略, 并由此催生出信息化视角下的智慧教育、智慧校园和智慧课堂。2010 年, 《国家中长期教育和改革规划纲要(2010-2020)》提出“信息技术对教育具有革命性影响, 必须予以高度重视”。培养“智慧人”成为了国内教育变革的重大战略选择。近年来关于智慧课堂的研究不断增加, 代表着许多一线教师正致力于向创新科技型教师转型。因此, 本文运用文献计量学理论与 Citespace 可视化软件, 对英语智慧课堂教育领域的研究历程、现状以及研究热点等问题进行探讨, 为日后相关研究提供参考, 为人工智能时代下学校改革, 教师创新提供理论参考。

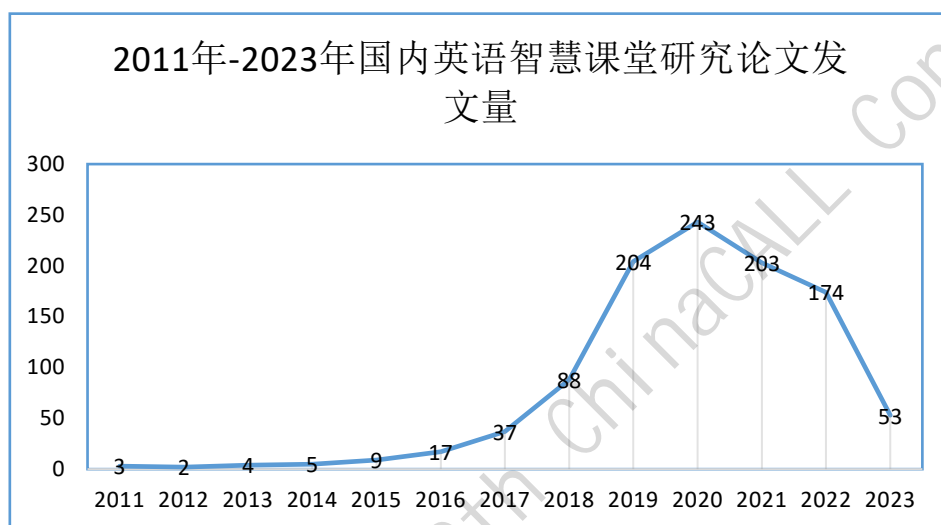
2. 研究工具与数据来源

本文的研究工具为美国德雷赛尔大学陈超美教授开发的 Citespace 可视化软件。该软件以图形展现数据, 并揭示数据背后的知识体系, 这种直观展现数据的图形被称为“科学知识图谱”。绘制这种图谱能够较为直观和科学的识别智慧课堂领域的热点话题, 展现学科发展新态势^[1]。本文以题名“主题名=智慧课堂, 副题名=英语教学”在中国学术期刊网络出版总库(CNKI)中进行检索。对检索结果进行筛选, 只选择期刊文献, 共检索出 1042 篇期刊文献, 构成了本研究的文献样本。将上述有效论文以 Refworks 格式输出文献, 再将得到的数据以 txt 文件格式导出, 并以 Citespace 可识别的文件名进行处理。本文研究的时间跨度限定为 2011-2023, 因为关于英语教学智慧课堂的研究文献在 2011 年第一次出现。然后, 再运用文献计量学知识以及 Excel、Citespace 软件整理出国内近 13 年在英语教学领域关于智慧课堂的建设的文献发展、发文机构、核心作者与学术研究热点。

3. 高中英语智慧课堂研究总趋势与机构分布

3.1 总体趋势与特点

本文根据年度发表情况,运用 Excel 软件,分别以年代和发文量为横、纵坐标绘制出论文发表量分布图。如图一所示,国内英语智慧课堂研究整体呈发展趋势,可将这一发展趋势分为三个阶段:第一阶段为萌芽阶段(2011-2015),发文量很少,年产量 4.6 篇。第二阶段为高速发展阶段(2016-2020),这一阶段在国内关于英语智慧课堂的相关研究如雨后春笋般高速增长,并于 2020 达到峰值(243 篇)。这是因为 2016 年,我国教育界在正式发布的《中国学生发展核心素养》总体框架中提出以培养“全面发展的人”为核心要义,即提出核心素养的智慧课堂 2.0 阶段。从这一年开始,以广州为首的城市遍开始大力探索关于智慧课堂建设。就第三阶段为稳定产出阶段(2021-2023),这一阶段的平均产量为 143 篇。



图一 2011 年-2023 年我国英语智慧课堂研究论文发文量

3.2 主要发文机构

在 Citespace 软件中选定 node types 为 country, 时间范围在设定在 2011-2023, 不更换其他参数, 得出数据后整理到 Excel 中得到如下数据。

表一 我国英语智慧课堂研究居前十位的城市发文量统计

排名	城市名称	发文数量
1	江苏	53
2	安徽	26
3	南京	21
4	广东	15
5	合肥	14
6	吉林	13
7	上海	9
8	内蒙古	9
9	福建	9
10	天津	7

如表一所示,作者通过对以城市名称开头命名的机构进行统计,发现对英语智慧课堂的研究中,位列前三的城市分别是江苏(53 篇),安徽(26)篇和南京(21 篇)。以上城市多分布在我国沿海地区,说明我国沿海地区对智慧课堂开展的研究较多且较为深入,引领者我国内陆地区关于智慧课堂的研究与探索。

4. 高产作者及合作图谱分析

4.1 作者发文量统计

某一领域学者的学术研究水平可以由作者的发文数量直接反映出来^[2]。因此，运用 Citespace 对英语智慧课堂研究作者的发文量进行分析，就可以确定这个领域的核心作者，从而促进关于智慧课堂构建的交流与发展。借助 Citespace 软件对 1042 条数据进行分析，选择节点类型 node types 为 author，选 time slicing 时限为 2011 年到 2023 年，不更换其他参数，得出数据后整理到 Excel 中。

表二 作者发文量统计

排名	作者	发文量	初使发表年份
1	文芳	7	2011
2	陈均	6	2011
3	潘正友	5	2021
4	陈静	4	2017
5	曾臻	4	2020
6	凡承阳	3	2020
7	孔新建	3	2022
8	李玉婷	3	2018
9	秦燕	3	2018
10	廉东昌	3	2017

如表 2 所示，发文量排名前二的作者分别是文芳（7 篇），陈均（6 篇），潘正友（5 篇）。这三位作者在对于智慧课堂在英语教学中的应用方面进行了较多的实践与研究。例如，文芳提到传统的英语听说教学模式暴露出很多的不足，教师可以通过智慧课堂改革英语听说教学。陈均提到提出飞行英语阅读翻转课堂向智慧课堂转型进阶的实施策略，为飞行英语阅读教学改革走出“翻转”困境提供启示。并提出智慧课堂模式下英语教师角色转化与提升机制研究。

4.2 作者合作图谱

合著研究一直是科学计量学较关注的问题，绘制作者合作图谱能够更加清晰直观地反映出某一学术研究领域专家学者的合作关系。科学合作在提高学者科研成果的质量和影响力上面发挥着很大作用，合作群体越大，研究成果越具有说服力^[3]。本部分通过绘制作者共现图谱以揭示国内英语智慧课堂教学研究的作者群体现状。绘制出图 2 所示作者合作图谱。



图二 2011年-2023年英语智慧课堂研究作者合作图谱

如图 2 所示, 其中的“N”代表节点, 即作者出现的位置节点, 作者的名字字号越大, 表明该作者在 1042 条数据中出现的频率越高。“E”代表连线, 节点之间的连线代表作者之间的联系, 连线越粗, 说明他们在同一篇文献中出现的频率越高, 由此可以看出作者间的合作关系。作者合作图谱中 N=1100, E=225。说明, 从 2011 年到 2023 年间, 一共有 1100 位作者对智慧课堂在英语教学领域进行了研究。在图中可以看到, 作者文芳、陈均等人的名字字号最大, 与上述的发文量统计排序一致, 即他们在这个领域发表的论文量最多。且从图中可以直观的看到部分作者之间的连线较多, 联系较为紧密。例如, 钟绍春、王梦雪、庞敬文, 王伟, 唐烨华等作者之间的连线很多, 说明这几位作者的合作关系密切。杨俊锋、肖广德、黄荣怀和胡永斌等人也有相关合作, 但是合作的不够密切。综上所述, 近年国内对于英语智慧课堂教学的研究有小团体但尚未形成大规模的的科研团队, 作者合作有待加强。因为只有通过多方面的合作, 我国智慧课堂的构建才会得到更好的发展。

5. 高中智慧课堂的研究热点

词频分析是在文献中提取能够表达文献核心内容的关键词或主题词词频的高低分布, 用以研究该领域的研究热点, 判断发展动向。本研究借助 Citespace 软件, 得出表三关于英语智慧课堂构建的共现关键词。从知识理论层面上看来, 频次与中心性较高的关键词能够代表某阶段内专家学者高度重视的话题, 即研究热点。如表三所示, 除去已知关键词智慧课堂, 出现频次较高的关键词有: 初中英语、小学英语、大学英语、高中英语、高职英语、英语教学、教学模式、教学策略等。中心性是测量节点重要性的标准之一, 关键词的中心性越高, 说明该词在文献中出现几率越大, 在领域内的影响力越强^[4]。本研究结合关键词出现频次、中心性以及文献内容的探析, 总结出国内英语智慧课堂的研究热点体现在下面几个方面: 理论背景、研究范围、应用价值及以及新兴技术创新等领域。

表三 英语智慧课堂研究热点关键词统计

序号	关键词	频次	中心性	序号	关键词	频次	中心性
1	智慧课堂	965	1.04	11	信息技术	30	0.12
2	初中英语	206	0.29	12	构建	22	0.04
3	小学英语	110	0.26	13	英语	21	0.06
4	大学英语	79	0.23	14	教学设计	20	0.06
5	教学模式	71	0.19	15	阅读教学	18	0.04
6	高中英语	67	0.22	16	构建策略	15	0.06
7	英语教学	45	0.1	17	听说教学	15	0.01
8	核心素养	44	0.09	18	电子书包	14	0.02
9	高职英语	40	0.1	19	教学	13	0.06
10	教学策略	31	0.08	20	策略	13	0.03

5.1 理论背景

核心素养的频次是 44, 说明是智慧课堂构建的重要理论背景和思想引领。马玲玲(2018)分析了核心素养的概念和构成, 继而从剖析高职英语教学困境入手, 论证以核心素养培养为目标的高职英语智慧教学模式构建的必要性^[5]。构建了核心素养培养引领高职英语智慧教学新模式。信息技术的频次是 30, 中心性是 0.12, 在信息技术高速发展大背景下, 教育信息化也有了新动向。祝智庭提出以智慧教育引领教育信息化的创新发展, 从而带动教育教学的创新发展, 已成为信息时代的必然趋势^[6]。唐烨伟、庞敬文等人就信息技术环境下如何构建智慧课堂的方法与学科教学深度融合的有关方面进行了思考, 梳理了智慧课堂与教学融合的不同应用层次, 提出了智慧课堂的构建方法并指出其核心为改变教学模型^[7]。

5.2 研究范围

如表三所示,关键词英语教学的频次为 45,中心性为 0.1。在这个范围以内,关键词出现频次比较高的分别有初中英语、小学英语、大学英语、高中英语、职高英语,中心性分别为 0.29、0.26、0.23、0.22 和 0.1。由此可知智慧课堂在英语教育教学领域的每个阶段都发挥着较大的作用。尤其是在初中英语教学中运用更广泛,福建杜鹃老师从课前预习、课中反馈、课后巩固三个环节探讨"智慧课堂"教学模式下的初中英语听说教学如何更好地培养学生的自主学习能力,锻炼学生的听说技能^[8];重庆林莉老老阐释了初中英语智慧课堂的内涵、特征并提供了案例研究^[9];无锡孙海燕老师立足于我国目前的初中英语教学中构建智慧课堂的现状,分析构建智慧课堂的必要性和重要性且提出了切实可行的具体措施^[10]。

5.3 应用价值

为了将智慧课堂应用于应用于英语教学以提高学生的信息素养,关于英语智慧课堂的教学模式,教学设计,教学策略探究也逐渐增多。邓奕华探究了蓝墨云班课构建混合式教学模式智慧课堂效果^[11];杨俊芳基于智慧课堂下的小学英语教学的进行了实践与思考,认为现代社会是一个信息时代,小学英语课堂也逐渐走上了"多元化、信息化、自主化、生活化"的道路。基于智能信息技术的智慧课堂是对传统课堂教学的"革命",正在重构着英语教学的教學环境、教学模式、学生学习方式和师生角色。对于推进人才培养模式和教学方法变革,重构信息化背景下的教学体系,具有重要的应用价值和意义^[12]。

6. 结语

在进行研究的过程中,有效利用研究工具能够为研究者提供便利,本文使用 Citespace 这一可视化软件对国内英语智慧课堂的研究发展概况进行了探究。借助这一分析软件,本文通过探讨智慧课堂的发展趋势、发文区域、核心作者及研究热点,呈现出近 13 年来智慧课堂在教育领域下英语课堂中的成长历程。研究发现:(1)我国关于智慧课堂应用在英语教学领域的研究从 2016 年开始高速发展,在 2020 年达到峰值后在近几年稳步发展。(2)我国关于英语智慧课堂的研究主要集中在沿海发达地区,在内陆地区还有待继续开发研究。(3)对英语智慧课堂做出研究的作者很多,但是还缺少研究者和研究者、研究者和研究机构之间的合作。因此,在信息技术持续发展的大背景下,无论是高校教师还是一线教师都应该在原有的基础上寻找新的研究点、加强对薄弱环节的研究。

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基于深度学习的语言研究述评

刘旭

摘要: 基于深度学习方法的交叉学科是近年来的研究热点。凭借强大的特征表示和学习能力,深度学习也受到了语言研究的关注。对相关研究综述发现,目前深度学习方法多用于处理语言的识别和分类任务,关注的对象主要分为(1)语言单位,包括音素、单词、句子和句法、语义和语境等,和(2)语言相关现实应用,包括语言教学、冒犯性语言检测、和脑信号交流等。综述分析了深度学习方法应用于语言研究所面临的问题和挑战,主要体现在(1)研究主题欠缺和技术应用简单;(2)可解释性和可理解性不高;及(3)获取数据困难和训练样本较小。

关键词: 语言研究;深度学习;综述

1. 前言

深度学习(deep learning, DL)作为一种新的机器学习方法,是机器学习的一个重要分支,也是目前人工智能领域的研究热点之一。深度学习最早受生物神经元工作模式的启发,由心理学家 McCulloch 和数学家 Pitts 提出的神经元的数学模型。随着计算机技术的快速发展,深度学习领域不断实现重大突破。作为人工智能领域的研究热点和主流发展方向之一,其最终目标是让机器能够像人一样具有分析和学习的能力,识别各种复杂的数据,从而实现人工智能。深度学习已经渗透到各行各业,并在计算机视觉(Durand et al., 2019)、自然语言处理(Wang et al., 2019)、智能环境(Huve et al., 2018; Behncke et al., 2018)等多个领域取得成果。近年来,深度学习也逐渐受到了语言领域的关注。然而,目前对这一研究领域的综述性文章尚不完善。

本文对基于深度学习的语言研究展开综述。首先,介绍了目前主要用于语言研究的深度学习算法及原理;然后对深度学习方法在语言相关研究中的具体应用进行回顾和总结,主要关注语言单位,包括音素、单词、句子和句法、语义和语境,及相关现实应用,包括语言教学,冒犯性语言检测和脑信号交流等;最后进行总结和展望,分析深度学习方法应用于语言研究所面临的问题和挑战。

2. 深度学习算法

根据检索到的文献来看，当前深度学习方法主要用于处理语言相关的识别和分类问题。其中使用的主要方法包括前向传播过程和反向传播过程。

对于前向传播过程，每个节点首先对前一层节点的输出值进行线性组合，然后经过非线性变换后进行输出。每一个输入样本经过线性和非线性组合得到第一层隐含节点的输出值，通过重复这个过程可以得到更深层次的隐含节点值，最后一层隐含节点和输出层进行连接并完成分类并输出。通过神经网络进行特征提取，再将最后一层特征输入到分类器中，如支持向量机，可以实现较好的分类，包括语言相关脑区分类(Munsell et al., 2019; Wang et al., 2019; Yuan et al., 2019; Xu et al., 2020; Vassar et al., 2020; Wang et al., 2021)、元音和辅音分类(Zhao & Rudzicz, 2015; Sun & Qin, 2016; Mahmud et al., 2021; Bi et al. 2021)、语音错误分类(Jiao et al., 2021)、冒犯性语言分类(Dadvar et al., 2013; Burnap and Williams, 2015; Modha et al., 2018)等。

反向传播过程是指通过链式求导法，从输出层逐层向前计算损失函数对隐含节点输出值和连接权重的梯度。这一过程在前向传播过程就已经开始，前向传播将计算完的一部分保存，另一部分由反向传播进行计算，然后再与前向传播计算的一部分相乘，逐层对参数进行更新。通过大量数据样本进行多次循环训练，直到损失函数不再下降或达到设定的迭代次数。反向传播算法结合深度学习网络已被应用于如识别语义相关的 N400 信号等相关研究(Laszlo & Plaut, 2012; Brouwer et al., 2017)。

3. 语言单位

人类掌握语言的能力被称为语言能力，体现在语言、文字相关的全部智力活动，这些活动与大脑皮层某些特定的区域有关，目前，已有不少研究使用深度学习方法进行语言相关脑区的识别和分类(Munsell et al., 2019; Yuan et al., 2019; Wang et al., 2019; Xu et al., 2020; Vassar et al., 2020; Wang et al., 2021)。语言活动离不开构成语言能力的语言系统，其可划分为音素、单词、句子、句法和语义等基本单位。本节对语言单位研究的深度学习方法进行回顾和总结。

3.1 音素

音素是根据语音的自然属性划分出来的最小语音单位。根据检索到的文献来看，目前深度学习方法已经被用于研究不同语言的音素识别和分类，使用的方法包括支持向量机(Mahmud et al., 2021; Bi et al. 2021)、深度信念网络(Zhao & Rudzicz, 2015)、遗传算法

(Korkmaz et al., 2019; Bird et al., 2020; Aissiou, 2020; Ibrahim et al., 2020), 以及其他组合模型 (Sun & Qin, 2016; Bhowmik & Mandal, 2018; Mathad et al., 2020)。

有不少研究使用深度学习方法成功识别并分类英语语音中的音素。Zhao 和 Rudzicz (2015) 记录了 12 名英语健康被试在刺激状态、想象语音和正常说话状态下的脑电 (electroencephalogram, EEG) 数据, 然后通过深度信念网络 (Deep Belief Network, DBN) 和支持向量机 (Support Vector Machine, SVM) 分别对被试的语音数据进行分类。结果发现 DBN 对英语语音中辅音的识别准确率 (90%) 高于 SVM。Sun 和 Qin (2016) 基于神经网络设计了 EEG-speech 模型 (NES), 该模型在 14 名英语健康被试想象语音的音素 (元音、辅音、鼻音、双唇音、高前元音 /iy/ 和高后元音 /uw/) 分类表现优于 SVM, 对高后元音 /uw/ 的分类准确率优于 DBN。Bird 等人 (2020) 基于遗传算法优化的深度神经网络 (Deep Neural Networks, DNN) 成功识别了英语语音中的双元音, 并且仅 69 秒就达到了 86.73% 正确率, 优于隐马尔可夫模型 (Hidden Markov Model, HMM)。Mahmud 等人 (2021) 记录了 49 名英语健康被试对英语元音刺激 (如 /a/) 产生的 EEG 数据, 通过 SVM 和稳定性选择确定了分类感知在大脑中在何时何地最佳解码。其中刺激编码期间 (0~260ms) 有 13 个脑区表现出典型的分类特征, 决策阶段 (后 300ms) 有 15 个脑区表现出分类特征。不局限于元音和辅音, Mathad 等人 (2020) 还提出了基于深度神经网络鼻音模型, 该模型通过无监督方法成功识别了腭裂儿童语音产出过程中的鼻辅音 (/m/、/n/、/ŋ/)。

除了英语音素之外, 深度学习方法也被应用于其他语言音素的识别和分类。Bhowmik 和 Mandal (2018) 使用区别语音特征和 DNN 对孟加拉语语音中的音素进行分类, 结果表明 DNN 对孟加拉语音素的分类优于 HMM 和多层感知机 (Multilayer Perceptron, MLP)。Korkmaz 等人 (2019) 使用遗传算法对土耳其语语音中的 8 个元音 (/a/、/e/、/i/、/o/、/ö/、/u/、/ü/) 进行分类, 结果发现, 遗传算法结合曼哈顿距离音素分类的正确率可达到 100%。Aissiou (2020) 和 Ibrahim 等人 (2020) 同样将遗传算法和曼哈顿距离结合, 成功识别出了阿拉伯语语音音素。Bi 等人 (2021) 结合偏最小二乘回归 (partial least squares regression, PLS) 和 SVM 建构的异质音素识别框架还成功识别了法语语音中的音素, 包括 15 个元音, 3 个半元音和 17 个辅音, 其准确率高于 SVM。

综上, 目前已有不少研究将深度学习方法应用于不同语言的音素研究, 包括英语、法语、孟加拉语、土耳其语和阿拉伯语等, 其主要任务为识别和分类任务, 可识别和分类的音素包括元音、辅音、双元音和鼻音等。

3.2 单词

单词是最小的有意义的单位。用于单词研究的深度学习方法包括循环神经网络 (Monsalve et al., 2012; Frank & Thompson, 2012; Frank et al., 2015)、隐马尔可夫模型 (Porbadnigk et al., 2009)、word2vec 算法 (Hultén et al., 2021)、注意力迁移架构 (Schrimpf et al., 2021)、以及其他组合模型 (Moses et al., 2021)

深度学习方法同样多用于单词识别和分类任务。Monsalve 等人 (2012) 通过自定步速阅读范式搜集了 54 名英语健康被试的单词阅读时间数据 (RTs) 并建立基线回归模型。对句子中的单词进行词汇化和非词汇化的惊奇值评估发现, 循环神经网络 (Recurrent Neural Network, RNN) 在词汇化模型的表现优于短语结构语法模型 (Phrase Structure Grammar, PSG), 且准确度随着训练的增加而提高。Frank 和 Thompson (2012) 使用相同的范式收集了 17 名英语健康被试的 RTs, 再次证明了 RNN 对单词惊奇值的解释力比 PSG 更强, 即更能发现句子中单词的差异。基于识别单词的基本任务, 后续研究又对单词展开更精细的分类任务, 如词类识别。Frank 等人 (2015) 基于 ERP 数据比较了 n 元模型、RNN 和 PSG。结果发现, n 元模型对于单词的整体解释力优于 RNN, RNN 对实词的解释力优于 n 元模型, 但三种模型在解释虚词上的表现都不好。Hultén 等人 (2021) 搜集了 20 名芬兰健康被试的具体和抽象单词判断任务的脑磁图 (magnetoencephalogram, MEG) 数据, 进而使用 word2vec 算法建立模型解码 MEG 数据, 最终成功识别了抽象单词和具体单词神经表征的差异。除了词类差异外, Porbadnigk 等人 (2009) 还发现通过组块形式呈现单词的识别率高于随机呈现和序列呈现。该实验搜集了 21 名德语健康被试想象单词的 EEG 数据, 并使用 HMM 对 EEG 数据中的单词进行识别。

在单词解释力方面, 迁移方法表现出了较强性能。Moses 等人 (2021) 搜集了 1 名构音不全合并痉挛性四肢瘫痪患者执行孤立单词任务和句子任务的模糊语音数据, 并建立了基于迁移学习的单词分类模型, 最终分类正确率高达 93%。Schrimpf 等人 (2021) 分别在四个英语数据集上对四十三个语言模型 (包括嵌入式、循环、基于注意力迁移架构) 进行测试。结果发现, 基于注意力迁移架构的 GPT2-xl 在单词探测任务数据上表现出了最强性能, 其中中间层明显优于输入层和输出层, 而嵌入式模型 (如 GloVe) 表现最差。

总体来看, 目前深度学习方法主要用于单词识别任务和解释力方面, 研究的对象包括实词、虚词、名词、具体单词和抽象单词等。此外, 也有研究发现了单词呈现形式对模型识别率的影响, 即组块呈现优于随机呈现和序列呈现。

3.3 句子和句法

句子是语言的基本单位，目前有关句子研究的深度学习模型架构主要有 RNN (Aurnhammer & Frank, 2019)、Transformer (Merkx & Frank, 2020; Schrimpf et al., 2021) 和 InferSent (Anderson et al., 2021)。Aurnhammer 和 Frank (2019) 对比了 RNN 架构，包括门控循环单元 (Gate Recurrent Unit, GRU)、长短期记忆网络 (Long Short-Term Memory, LSTM)，和简单循环网络 (Simple Recurrent Network, SRN) 在预测英语句子上的表现。分别在自定步速阅读 (Self-Paced Reading, SPR) 数据、眼动数据和 EEG 数据进行训练，结果发现 GRU 和 LSTM 预测句子的准确度比 SRN 高，但并无较大差异。Merkx 和 Frank (2020) 使用相同的数据集对 Transformer 和 GRU 预测句子能力的差异进行比较。结果发现，Transformer 的整体表现优于 GRU。值得注意的是，在 SPR 数据中，GRU 训练短句的表现优于 Transformer，而 Transformer 训练长句的表现优于 GRU。Anderson 等人 (2021) 搜集了 14 名健康被试阅读英文句子的核磁数据，使用 InferSent 模型来预测句子激活的效果，结果发现 InferSent 的表现优于 GloVe 和 Grammar 模型。实验进一步在 ELMo 和 BERT 进行分析，结果发现 BERT 12 层的预测精度最高，但并不比 ELMo 或 InferSent 有明显提升。Schrimpf 等人 (2021) 分别在四个数据集上对四十三语言模型 (包括嵌入式、循环、基于注意力迁移架构) 进行测试。结果发现在阅读问答和句子朗读任务中，基于注意力迁移架构的 GPT2-xl 表现最好，其中中间层明显优于输入层和输出层。

句子的组成离不开句法规则。目前，用以相关句法研究的深度学习方法主要有 RNN (Mikolov et al., 2013; Van Schijndel & Linzen, 2018a; Van Schijndel & Linzen, 2018b) 和 RNNG (Brennan et al., 2020)。Mikolov 等人 (2013) 基于 RNN，通过句法类比问题在句法数据集上捕捉句法规则。结果发现，RNN 能够很好地捕捉到句法规则，并取得了近 40% 的正确率。除了识别基本的句法规则，Van Schijndel 和 Linzen (2018a) 还通过语法模型和 RNN 预测出了花园小径歧义句中不断增加的难度，但无法预测更简单或更难歧义之间的差异。Van Schijndel 和 Linzen (2018b) 进一步调节 RNN 模型用以预测抽象的句法结构，包括简单关系从句和与格转换。此外，Brennan 等人 (2020) 基于 26 名被试听有声故事书的核磁数据，训练递归神经网络语法 (Recurrent Neural Network Grammars, RNNG) 根据句法学中的树形图规则来划分句子结构。

由上，深度学习方法主要用来句子的预测，并且可识别的数据种类多样，包括 SPR 数据、眼动数据、EEG 数据、fMRI 数据等。此外，深度学习方法还可以对句子中的语法规则进行识别，包括识别花园小径歧义和学习树形图规则等。

3.4 语义和语境

语义是指自然语言的意义，包括单词，句子，语篇等不同级别的语言单位。语义相关的深度学习方法包括 RNN (Mikolov et al., 2013)、n 元模型 (Frank et al., 2015)、SRN (Brouwer et al., 2017)，和其他组合模型 (Laszlo & Plaut, 2012)。Mikolov 等人 (2013) 使用 RNN 在语义测试集上捕捉语义规则，发现 RNN 向量能够很好地捕捉到语义规则，并且超越了之前的最佳系统——UTD-NB (Rink and Harabagiu, 2012)。Frank 等人 (2015) 基于 n 元模型、RNN 和 PSG 分析了 24 名健康被试阅读英语句子的 ERP 数据，并检验了 6 个 ERP 成分，包括词汇、语义和概念加工相关的 N400、EPNP 和 PNP，以及句法加工相关的 ELAN、LAN 和 P600。结果发现，n 元模型最好地解释了 N400 效应 (300-500ms)，但研究未发现基于单词或语法的预测和 P600 之间的关系。Brouwer 等人 (2017) 基于 SRN 和反向传播 (Back Propagation, BP) 设计了包括“检索”和“整合”两部分的神经计算模型，其中“检索”将单词表征映射到语义表征，“整合”将语义表征映射到上下文语篇表征。该模型对 40 个英语主动句和被动句中关键词的 N400 和 P600 进行分析，并且成功捕捉到了语义相关的 N400 和 P600 效应。Laszlo 和 Plaut (2012) 构建了分布式并行处理 (PDP) 模型，旨在模仿 N400 振幅并产生相似的语义激活。结果发现 PDP 对于真词、假词、首字母缩写和非法字符串的语义激活时间进程与 N400 非常相似，而且还能模仿 N400 后期成分——晚期正波 (LPC)。值得注意的是，该模型还成功捕捉到了 N400 的时间动力学。

语义是由语境所决定，离开语境的语义没有任何意义。根据检索到的文献，目前语境相关研究只涉及了语言模型的语境任务。McClelland 等人 (2020) 设计了一个强调语境任务的综合理解系统，该系统能够模仿大脑中神经元池的连接组成，并将神经元池和内侧颞叶系统互相影响。通过删除神经网络中的部分隐性单元模拟神经元的破坏，结果发现系统的表达能力也随之下降。

综上，目前基于深度学习方法主要用于解释语义相关的 ERP 成分，以 N400 和 P600 为主。其中也有自主架构模型可以对 ERP 成分进行模仿，如 LPC。相较而言，语境研究比较缺乏。但已有研究将语言与物体和情境的表征联系起来，强调对具体情境的理解，这为未来语言理解系统更接近于人类水平提供了新的见解。

3.5 小结

总的来说，目前基于深度学习方法的语言研究较少，使用的研究方法尚处在简单阶段，距离实际应用甚至工程化还相差甚远。并且，应用深度学习研究方法研究语言单位还存在大量空缺，如不同词类的区分，包括真词和假词、名词和动词等，不同句法歧义现象的解释，以及更大的语言单位的分析，如语篇等。此外，针对当前大多数研究结果主要依托英语，未来研究应积极寻找将深度学习方法应用至其他语言的可能，如汉语特有的声调和字形，日语独特的句法结构等。

4. 现实应用

除上述有关语言单位的研究外，深度学习方法凭借优异的处理和分析的能力，进一步被应用至语言相关的现实领域，包括语言教学、语言检测、和脑信号交流等。

4.1 语言教学

已有不少研究将深度学习方法应用于课堂教学，主要包括口语教学(Ran et al., 2020; Jiao et al., 2021; Wen & Yue, 2021)、英语课堂行为分析(Zhang, 2020)和英语学习应用程序(Cho & Kim, 2021)，使用的深度学习方法有 HMM、DBN、SVM 和 CNN 等。

Ran 等人(2020)使用 HMM 开发了一个用于纠正英语口语的模型，该模型可以对语音中的孤立单词进行识别并纠正。经过一个学期的学习，使用该模型的 30 位同学比未使用的口语成绩提高了 20 分左右。Jiao 等人(2021)基于 DBN-SVM 同样设计了一个适用英语口语教学的系统，可以对发音数据进行错误检测、分类、打分和纠正，其中识别准确率最高可超过 80%。研究还进一步分析了不同环境下词汇对该模型识别率的影响，结果发现随着环境噪声和词汇的增加，模型对单词的识别有所下降，但总体识别正确率仍维持在 90%以上。

Wen 和 Yue(2021)同样基于 DBN 构建了语音评估模型，该模型用于评估中国英语学习者的英语口语，包括语调、音调、语速。模型对 400 个大学生的句子录音进行评估，其总体评估结果和人工评估结果的一致性率达到 92.5%。Zhang(2020)使用函数链神经网络和图片识别技术构建了一个应用于英语教学课堂的特征识别模型，并通过混合岭回归分析对中国学生的课堂行为特征进行分析。该模型能成功检测出每位学生在课堂上的行为状态，并且可以给出反馈。Cho 和 Kim(2021)基于卷积神经网络(Convolutional Neural Networks, CNN)创建了英语教学应用程序，CNN 被用于将文本与行为联系起来从而提供自然、准确的交互。该程序通过模拟现实情境完成虚拟交互，旨在促进英语学习者的学习兴趣。

4.2 冒犯性语言检测

深度学习方法还被用于网络社交媒体中冒犯性语言的检测和分类 (Dadvar et al., 2013; Burnap and Williams, 2015; Modha et al., 2018; Gambäck & Sikdar, 2017; Zhang et al., 2019; Altin et al., 2019), 使用的深度学习方法包括 SVM、CNN 和双向长短期记忆网络 (Bi-directional Long Short-Term Memory, BiLSTM) 等。

Dadvar 等人 (2013) 通过基于内容、特定网络欺凌和用户三个特征来训练 SVM, 试图将 YouTube 评论分为冒犯性和非冒犯性语言。其中 SVM 分类准确率最高为 77%, 且其性能随着相关特征输入的增多而提高。Burnap 和 Williams (2015) 使用了贝叶斯多元回归、随机森林决策树和 SVM 分别对 Twitter 上带有仇恨或敌意的推文进行分类, 结果发现三个分类器的表现相似。Modha 等人 (2018) 等人同样借助 SVM 成功区分了英语、印地语和罗马化印地语中的冒犯性语言, 包括“公开攻击”、“隐含攻击”和“非攻击”三个维度。除了使用 SVM, Gambäck 和 Sikdar (2017) 还通过 CNN 将 Twitter 仇恨言论分类为种族主义、性别歧视、两者 (种族主义和性别歧视) 和非仇恨言论。研究共使用四个 CNN 模型进行训练, 结果表明基于 word2vec 的 CNN 模型能最优完成冒犯性语言的分类。Zhang 等人 (2019) 和 Altin 等人 (2019) 还使用 BiLSTM 来挖掘文本中深层语义信息, 进而识别 Twitter 中的冒犯性语言并完成分类, 分类准确率约 64%。

4.3 脑信号交流

脑信号的最大优势之一是使失去大部分运动能力 (如说话) 的病人能够与外界交流。深度学习方法提高了基于脑信号的交流效率。以 P300 信号为代表, 它可以检测用户关注的是什么字符, 并在没有任何运动系统参与的情况下进行打字并完成交流。深度学习可以对 P300 信号进行识别并分类 (Kawasaki et al., 2015; Liu et al., 2018; Maddula et al., 2017; Zhang et al., 2018), 涉及的方法包括 MLP、CNN、RCNN 和其他组合模型。

Kawasaki 等人 (2015) 构建了 6 层多层感知机 (MLP) 对 EEG 数据中的 P300 成分进行分类, 结果表明, MLP 正确学习并提取了 P300 特征, 且 MLP 层数越高, 表现越好。Liu 等人 (2018) 基于 CNN 设计了 6 层批标准化神经网络 (BN³) 来检测 P300 信号。BN³ 不易受到过拟合的影响并且训练速度更快, 对 P300 的检测率达到了历史最优。Maddula 等人 (2017) 搜集了 9 名健康被试执行 P300 字母拼写范式的 EEG 数据, 然后将其时间序列表征为二维 (2D) 图像序列训练 RCNN。论文对比三种模型结构发现, 3D-CNN 与 2D-CNN 和 LSTM 结合

使用表现最佳,其中 3D-CNN 最有效地模拟了 P300 的空间和时间信息。Zhang 等人(2018)提出的混合模型结合了 RNN、CNN 和自动编码器 (Auto-Encoders, AE), 通过提取 EEG 数据中的信息来识别被试想说什么字母。RNN+CNN+AE 成功学习了 EEG 数据的时间和空间特征, 在公共数据集中的分类准确率近 96%, 且在 55%的可用数据上就可以达到目标准确率; 在本地数据集的分类正确率近 95%。优于 CNN、RNN 和 RNN+AE+XGBoost。

4.4 小结

本章进一步总结了深度学习方法在语言相关现实领域中的应用, 包括语言教学、网络平台语言检测, 和以实现人机互动为目的的脑信号交流。由上可以看出, 深度学习方法在语言领域的研究中不局限于语言本身, 而是逐渐向语言相关现实应用过渡, 且呈现出了工程化的趋向。然而, 应用过程中仍存在许多不足, 包括 (1) 涉及领域较小, 如在语言教学领域, 目前大多依托音素层面进行口语教学应用, 且应用处于初步阶段; (2) 使用技术简单, 口语教学的应用主要以单向纠错为主, 未来应以打造更真实的对话模式为导向, 实现双向互动; (3) 可解释程度较低, 相比对语言单位较高的识别和分类准确率而言, 冒犯性语言检测的分类准确率大多在 80%以下, 并未充分发挥深度学习强大的学习能力。

5. 存在的问题和挑战

综上, 目前虽然深度学习技术已逐渐开始应用于语言相关研究中, 并为一些问题提供了新的解决方案。但由于深度学习本身仍然存在一些问题、仍处于逐步探索和深入研究阶段、以及不同语言本身的复杂性和特殊性, 深度学习技术在语言领域的应用仍然面临诸多挑战, 具体总结如下,

一、研究主题欠缺, 模型技术简单。就目前来说, 语言相关研究和深度学习技术的结合尚处于初步阶段, 研究内容未完全触及语言相关的所有主题, 如语境和语义、语篇等相关领域较少。此外, 深度学习技术也并未全部应用于语言研究中, 已经应用于语言研究的深度学习技术还处于简单分析或模仿的阶段。

二、可解释性和可理解性不高。虽然深度学习可以记住大量的数据, 但其模型复杂、参数多, 学习过程是一个“黑匣子”学习过程, 学习结果的可解释性差, 因此, 深度学习技术在语言研究中的应用同样存在可解释性差、可理解性差的问题, 其距离对语言数据可解释性和工程化还相差甚远。针对这一问题, 或可以将深度学习与具有可解释性的算法, 如决策树等, 进行结合。

三、获取数据困难、训练样本较小。深度学习模型通常需要大量数据，在小样本条件下会产生严重过拟合问题，从而导致网络的泛化能力急剧下降。而语言领域中的实验研究相对较少，大量实验数据样本的获取和标注的困难是一个不可忽视的问题，因此样本量不足已成为制约深度学习方法在语言研究应用的重要因素。不过，近些年提出的一次学习和零次学习方法或可缓解这个问题。

6. 结语

深度学习目前已成为人工智能领域的研究热点，随着对深度学习研究的深入，其在多个领域都取得了重大进展，深度学习技术的发展也为语言相关研究提供了新思路。由于语言自身复杂性、交叉学科难融合等原因，语言结合深度学习等研究仍然面临着诸多挑战。本文回顾总结了深度学习方法在语言单位，包括音素、单词、句子和句法、语义和语境的应用，然后进一步分析了其在相关语言领域中的现实应用，最后指出了深度学习方法用于语言研究存在的问题与挑战。

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教育数字化背景下的混合式大学综合英语智慧课堂创新转型

深圳大学 胡春华

摘要 在教育数字化时代,智慧课堂教学范式改革势不可挡。智慧课堂以教师为主导、学生为主体,其内涵特征可以概括为五个方面,即立体化、智能化、个性化、交互性和全方位。华南地区某高校在综合英语改革创新方面的教学实践表明,线上下相结合的混合式综合英语智慧课堂模式将课前准备、课堂活动以及课后实践通过线上、线下资源联动整合起来,实现了双效互动并构建了一个智慧循环的体系。本研究通过随机对该校三个采用综合英语混合式课堂的班级英语专业学生的问卷调查和访谈五名授课教师发现,学生对该模式的满意度和学习效果总体持积极态度,推崇智慧课堂丰富的教学资源和新奇的教学方式;受访授课教师普遍认为混合式大学综合英语智慧课堂模式是传统课堂的有益补充,有助于提升学生的阅读能力、自主学习能力与合作能力等。

关键词 教育数字化 混合式智慧课堂 综合英语

1 引言

早在2012年3月,教育部发布的《教育信息化十年发展规划》中就提出了推动信息技术与高等教育深度融合、创新人才培养模式等重要内容,这在很大程度上标志着我国高等教育信息化时代春天的来临。值此契机,2014年修订的《大学英语教学指南》(征求意见稿)也适时提出:“大学英语应大力推进最新信息技术与课程教学的融合……使学生朝着主动学习、自主学习和个性化方向发展”。在新媒体视频时代的新背景下,智慧课堂(Smart Classroom)俨然已经成为当代课堂发展的新趋势和新方向,这是新时期教育发展的现实需求,也是教育信息化向纵深发展的必然结果。高校综合英语教学在智慧课堂的实施和发展方面同样大有可为,这也必将助力英语教学质量实现质的飞跃。有鉴于此,高校综合英语教师应顺应时代潮流,在英语教学过程中将课程内容与信息技术相融合,通过智慧课堂提升学生的英语学习自主性,从传统意义上的自主学习切换为线下课堂教学与手机或电脑互联网等平台并进,尊重学生的个体差异和个性特征,因材施教,真正意义上实现了从传统英语教学到信息化英语教学的蜕变。

当然,智慧课堂在高校综合英语教学中的全面推广和有效实施不可能一蹴而就,应该理论研究结合课堂实际,积极稳妥渐进式推进,而不是一窝蜂地“扎堆”上研究项目和盲目实施。国内外关于智慧课堂和教学风格的相关研究文献也很多(Cohen,A.D & Weaver,S.J., 2006; 李平, 2016; 刘军, 2017; 蒙岚, 2019; 绍春, 2019; 王琦、黄宗伟, 2020),智慧课堂的研究热点经历了从硬件装备转向学习方式,再到通过数据分析学生在智慧课堂中的学习和认知过程等。尽管研究热点不断变换,学术界对智慧课堂的关注热度和研究兴趣依然有增无减。通过梳理国内智慧课堂的相关研究,我们发现我国大多数智慧课堂研究主要着眼于理论分析与系统构建等方面,在智慧课堂专业教学具体实施方面的研究较为鲜见。本文旨在分析智慧课堂的内涵和特征的基础上,探讨智慧课堂在大学综合英语教学中的实施意义和路径,并进一步通过学生问卷调查和教师访谈深入实证调查英语专业学生和教师对智慧课堂的态度和反馈,以期在提升学生学习体验感的同时切实提高大学综合英语课堂教学效果,并为国内兄弟院校智慧课堂的教学实施提供参考和借鉴。

2 智慧课堂的内涵特征

“智慧课堂”这一概念始于2008年美国IBM公司提出的“智慧星球”(Smart Planet)理念,即日益发展的高端科技和思维理念使地球上几乎所有的事物都可以通过先进的关联技术相互感知并互为联系,也就是通常意义上的“万物互联”。如今,“万物互联”俨然已经成为当代时髦语,它使智慧课堂的实施成为可能,智慧课堂的理念也正是建立在此基础之上的。从信息化时代视角出发,智慧课堂依托先进的信息互联网技术实现智慧型教学生态,实现了有别于传统教学方式的教学智能化和数字化。新兴可视化技术如增强现实、虚拟现实支持下的沉浸学习、智能反馈模式下的语言训练等正在不断深化技术化范式下的外语教育信息化理论和时间内涵(胡杰辉、胡加圣,2020)。因此,智慧课堂生态环境下的教学资源更加丰富,师生互动机制也更加灵活,学生的学习积极性和课堂活力焕然一新。从某种意义上说,智慧课堂打破了传统课堂教学的藩篱,重构了全新的教学环境,凸显了现代信息技术与课堂教学的深度融合对教学活动的促进作用。

在教学实践中,智慧课堂是指教师为实现教学大纲既定的教学目标,依托手机、电脑、Ipad等设备,借助腾讯会议、Zoom、钉钉、全时云等信息平台和一些出版社开发的教学平台实现的跨时空教学活动。就智慧课堂的内涵特征而言,国内外学者进行了很多有益的探索,其中以黄荣怀教授等提出的智慧课堂“SMART”模型尤为典型。该模型将智慧课堂归纳为内容呈现(Showing)、环境管理(Manageable)、资源获取(Accessible)、及时互动(Real-time Interactive)、情境感知(Testing)五个维度。这个模型的优势是从说文解字的角度诠释了英语单词“smart”中每个字母的内涵意义,让我们非常直观地感受到了智慧课堂的主要特征,呈现方式形象生动,但这种阐释方法难免显得有些牵强附会,严谨度不够。从一定意义上说,智慧发展是当代教育变革的一种基本价值走向,人类对智慧教育的认识是一个逐步渐进的过程。(杨现民,2014)。在笔者看来,尽管这个模型在很大程度上说明了智慧课堂的一些特点,但仅仅局限于理论层面,指导性和可操作性不是太强。

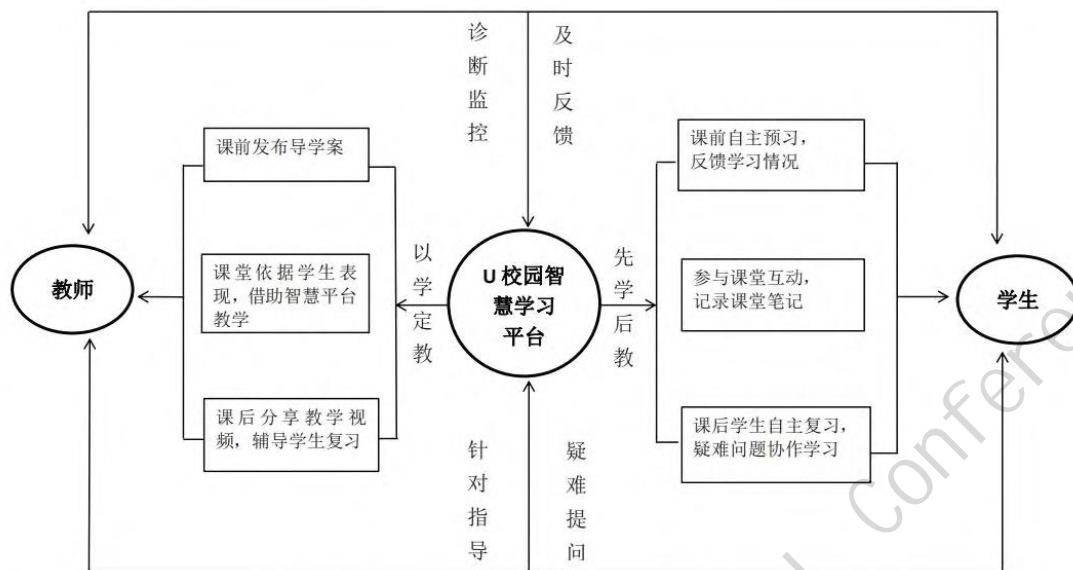
通过对相关文献的深入分析和实地调研,我们把智慧课堂的内涵特征概括为五个方面,即立体化、智能化、个性化、交互性和全方位。第一,智慧课堂的立体化指的是它拓宽了传统课堂教学的时间和空间,学生可以随时随自主学习,教师也可以及时通过网络平台开展教学活动。教学活动变得不再单调肤浅,向深度学习迈进,教学形式也多样化,如翻转课堂、慕课等创新教学模式。第二,智慧课堂的智能化指的是智能机器和软件的参与使传统课堂科技感十足,信息传输快速便捷,学生和教师的沟通也变得及时高效,学习效率和效果也得到极大提升。特别是在近三年疫情肆虐时期,经常需要从线下学习转到线上课堂,智慧课堂以其时代担当成为“时势造英雄”的不二之选。第三,智慧课堂的个性化体现在教师对学生个体差异和特性的尊重,教师从学生具体程度出发因材施教,学生也可以根据自身需求进行个性化学习。第四,智慧课堂的交互性强调的是师生之间的互动以及生生之间的互动,这种互动是协作式和批判式的,有利于提升智慧课堂教学效果。教室可以在智慧课堂中给学生布置一定的任务,然后在教学中以课堂内容带动学生的自主学习积极性。第五,智慧课堂的全方位指的是其对人才培养的定位是全方位、多维度的,注重学生的德、智、体、美、劳智慧型全面发展,培养品学兼优的专业人才。智慧课堂不仅关注学生的智力发展和专业学习,同样崇尚学生的人格塑造和思政素养锻造,教师在传授知识的同时培养学生的人格和品格,坚持“学高为师、身正为范”的为师准则,将道德教育贯穿于智慧课堂的

各个环节和整个过程，课堂氛围也会更有温度。就外语智慧课堂而言，我们教师在外语课堂中时常提醒自己要“讲好中国故事”，提升学生的文化鉴赏能力、国际视野、文化自信以及跨文化交际能力，结合思政育人理念培养学生正确的人生观、世界观和价值观，而不是一味地崇洋媚外和唯西方是从。从一定意义上说，外语教育实际上是跨文化公民的培养（Byram, 2008）。总之，智慧课堂这五个方面的内涵特征体现了智慧课堂实际实施过程中的具体操作细节，对实际教学活动具有较强的指导意义。

3 智慧课堂的实施路径：混合式综合英语智慧课堂实施情况调查

科技创新和信息技术的发展对教育的影响不言而喻，它们正不断重塑教育形态，知识的获取方式和传授方式以及教和学的关系正在发生深刻变革（钟富强，2021）。智慧课堂是信息化时代科技创新的产物，也是教学发展的必然，其可替代的优势也将引领未来学校教学的创变（祝智庭，2012）。同样，在大学综合英语智慧课堂教学中，现代信息技术与课堂教学的深度融合也为教学质量的提升创造了条件。智慧课堂的出现既给大学综合英语的实施带来了机遇，也同样触发了一系列挑战。在网络时代背景下，大学英语智慧教学需要进行科学设计并策略性地进行实施（吕明，2019）。在大学综合英语智慧课堂的实施过程中，教师要更新教学理念并调整课堂模式，逐渐适应信息化时代的智慧课堂教学生态，从课前、课中、课后三个阶段开展教学活动。同时，教师应及时和学生沟通教学问题和教学进度，以人为本，及时调整教学进度和教学节奏，这样才能保障大学综合英语智慧课堂教学目标的顺利实现。

在大学综合英语教学中，主要的教学平台有外研社的“U校园智慧教学云平台”、外教社的“We Learn 随行课堂”、高教社的“iSmart 外语智能学习平台”、清华大学和学堂在线等联合开发的“雨课堂”等等。这些外语教学平台的共同特点是可以提供教、学、练、测、评等系统化的丰富教学资源供教师和学生选择，这为顺利开展智慧课堂创造了条件。例如，“U校园智慧教学云平台”在用户体验方面口碑一直比较好，因为该平台设计细致周到，考虑到了教师和学生两个主体的实际需求。一方面，学生可以通过电脑或手机登录平台进行线上自主学习教材内容并进行练习，轻松实现课前自学；另一方面，教师可以线上发布学习任务、上传相关教学资源等，为人机协同的智慧课堂教学打下坚实基础，最终实现现代智能技术与教学的深度融合。智慧课堂中教学时空的拓展和教学资源的丰富多样使学习和教学变得不再枯燥乏味，学生在快乐中学习，教师也会因为学生的快乐成长和进步以及自身的教学相长而提升职业成就感，实现学生和教师在智慧课堂实施过程中的双赢。U校园智慧教学云平台学习模式主要包含三个环节，即课前准备、课堂活动和课后实践。具体如下图所示：



U 校园智慧学习平台下的智能交互一体模式

在当今信息化 5G 时代，网络技术和教学平台助力多教学主体，教师、学生、AI 教师、虚拟学伴、资源开发商、远程专家、业界人士等即时互联互通（甘容辉、何高大，2021）。“U 校园智慧教学云平台”的教学模式系统、实用，教学流程清晰细致，对综合英语智慧课堂具有很强的借鉴意义。综合英语课程一直都是英语专业学生专业基础类课程的重头戏，在大学一、二年级分四个学期讲授，单个学期课程的学分为四分，其地位不言而喻。近年来，为了进一步优化课程设置并提升教学效果，该校在综合英语教学方面进行了一系列的改革与探索，在优化教学方法和升级设备系统的同时精简课时，由原来的每周六学时缩减为每周四学时，强调学生的自主学习、个性化学习以及线上线下互补，这也为智慧课堂的发展和完善提供了契机。在具体教学实践中，受这三年来新冠疫情的影响，该校很多班级的综合英语课程经常在线上 and 线下之间来回切换，有时候也是线上和线下同时进行，所以实际上很多班级实施的是线上和线下结合的混合式智慧课堂。这种将线上、线下有机地结合起来的混合式智慧课堂模式实现了双效互动，以教师为主导、学生为主体，将课前准备、课堂活动以及课后实践通过线上、线下资源联动整合起来，构建了一个智慧循环的体系。

在硬件配套方面，华南地区某高校近年来在汇文楼投资建设了八间智慧教室，每个教室为学生配备了四个电脑大屏幕或两个讲台大荧幕，安装了先进的网络系统和软件平台，并配备专业电脑人员为混合式智慧课堂的顺利实施提供了技术维护保障。该校混合式综合英语智慧课堂经过这几年的建设和实施，积累了一些宝贵的教学经验，教学实践中也凸显了其在综合英语教学中可替代的优势。混合式综合英语智慧课堂的创新思维和教学实践离不开广大教师和学生的共同努力和孜孜探索。应该指出的是，深该校试点的混合式智慧课堂是一个系统工程，涉及教室、学生、课程、教室软硬件等多种错综复杂的因素，智慧课堂不是线上和线下的重复叠加，需要通过精心设计（张丹，2021）。因此，有必要深入了解该校学混合式综合英语智慧课堂的具体实施情况和师生反馈。在混合式综合英语智慧课堂教学模式实践几年后，我们随机对三个班级的英语专业学生进行了问卷调查，

以确定学生对该模式的满意度和学习效果等情况。同时,对五名采用混合式智慧课堂讲授英语专业综合英语课程的教师进行了访谈,深入了解教师对当前该校混合式综合英语智慧课堂教学现状以及在课堂中所使用的教学方法和资源的理解。

应该指出的是,混合式大学综合英语智慧课堂并不是完美无缺的,因为没有一种教学模式是完美的,只能是通过意义协商和建构进一步提升教学质量 and 效率(王文字等,2018)。因此,教师应该在智慧课堂中随时和学生保持沟通、互动与合作,最大程度地实现事先设定的课堂教学目标。为了以华南地区某高校为个案探索大学英语专业学生对混合式大学综合英语智慧课堂的学习期待和态度,我们在学期末将调查问卷通过问卷星发至三个班级微信群,学生通过微信或电脑作答,问卷采用统一的指导语和问卷作答程序。其次,对五名采用混合式智慧课堂讲授中和英语的教师进行了访谈,以便深入了解授课教师对混合式大学综合英语智慧课堂的理解和态度等。在数据研判过程中,我们运用 Excel 录入数据和分类整理,并采用 SPSS 22.0 软件进行统计分析。因此,我们希望通过从学生和教师双向维度厘清混合式大学综合英语智慧课堂实施过程、实施效果、存在的问题等,以期为今后大学综合英语智慧课堂的有效实施提供参考和借鉴。

3.1 学生问卷调查

本次调查发出问卷 110 份,提出信息不完整或作答不认真的无效问卷,共回收 102 份,有效问卷比例为 92.73%。其中,女生 91 份(占 89.22%),男生 11 份(占 10.78%);一年级 48 名(占 47.06%),二年级 54 名(占 52.94%);师范英语专业 39 名(占 38.24%),英语专业 63 名(占 61.76%)。学生以选择题形式对混合式大学综合英语智慧课堂进行了总结和反馈,从而发现其成效和不足。本研究的调查问卷主要包含个人信息(性别、年级和专业)和关于“混合式大学综合英语智慧课堂教学模式的应用效果”的问题两大部分,后者又细分为四个维度,即学生对智慧课堂教学模式的认可程度、学生对智慧课堂教学模式中教学设计的满意度、学生在课堂中的参与度和学习效果评价。

具体来说,本问卷调查中的主体部分调查混合式大学综合英语智慧课堂教学模式的应用效果,主要从以上四个维度总结学生在混合式大学综合英语智慧课堂中的收获和体会,绝大部分小项目提供五个选项,即非常赞同、赞同、一般、不赞同,以及非常不赞同。除此之外,个别小项目提供 6-7 个选项,以便更加全面地了解学生的喜好和态度倾向。第一,在学生对混合式大学综合英语智慧课堂教学模式的认可程度这个维度的问卷部分包括四个小项目,对第一个小项目“我喜欢这种教学模式”的回答,有 66.67% 的学生选择非常赞同,24.51% 的学生选择赞同,9.00% 的学生选择一般,没有学生选择不赞同和非常不赞同;对第二个小项目“我认为这种模式解决了传统课堂的弊端”的回答,有 55.89% 的学生选择非常赞同,31.37% 的学生选择赞同,7.84% 的学生选择一般,有 3.92% 的学生选择不赞同,有 1.01% 的学生非常不赞同;对第三个小项目“我喜欢用智慧课堂平台的教学工具学习相关的专业课程”的回答,有 56.86% 的学生选择非常赞同,30.39% 的学生选择赞同,8.82% 的学生选择一般,有 1.96% 的学生选择不赞同,有 1.96% 的学生非常不赞同;对第四个小项目“我希望将这种模式应用到其他学科的课堂中”的回答,有 49.02% 的学生选择非常赞同,36.27% 的学生选择赞同,9.80% 的学生选择一般,有 2.94% 的学生选择不赞同,有 1.96% 的学生非常不赞同。这四个小项目调查综合表明,学生对混合式大学综合英语智慧课堂持有较高期待,认可程度较高,混合式大学综合英语智慧课堂在学生中具有较好的群众基础。

第二，学生对混合式大学综合英语智慧课堂教学模式中教学设计的满意度调查部分设计了四个小项目，对第一个小项目“混合式大学综合英语智慧课堂的学习活动增加了我对本课程的兴趣”的回答，有 44.06% 的学生选择非常赞同，38.24% 的学生选择赞同，14.70% 的学生选择一般，有 8.82% 的学生选择不赞同，有 1.96% 的学生非常不赞同；对第二个小项目“我认为混合式大学综合英语智慧课堂学习的氛围非常轻松愉快”的回答，有 46.08% 的学生选择非常赞同，37.25% 的学生选择赞同，12.75% 的学生选择一般，有 2.94% 的学生选择不赞同，有 1.01% 的学生非常不赞同；对第三个小项目“老师在智慧平台上能够及时回答我在学习过程中遇到的问题”的回答，有 31.37% 的学生选择非常赞同，40.20% 的学生选择赞同，14.71% 的学生选择一般，有 7.84% 的学生选择不赞同，有 5.88% 的学生非常不赞同；对第四个小项目“老师通过智慧平台共享的学习资源能够加深我对知识的理解”的回答，有 48.04% 的学生选择非常赞同，34.31% 的学生选择赞同，15.69% 的学生选择一般，没有学生选择不赞同和非常不赞同。这些反馈表明，学生们总体认为混合式大学综合英语智慧课堂模式的学习活动增加了他（她）们对英语学习的兴趣，课堂学习氛围轻松愉快。同时，教师应及时关注教学平台上学生提出的问题，第一时间进行答疑解惑。

第三，在学生课堂中的参与度这个维度的问卷部分设计了三个小项目，其中前两项提供了五个选项，第三个小项目提供的是七个选项。对第一个小项目“我能够及时完成智慧平台发布的学习任务”的回答，有 53.92% 的学生选择非常赞同，38.24% 的学生选择赞同，3.92% 的学生选择一般，有 1.96% 的学生选择不赞同，有 1.96% 的学生非常不赞同；对第二个小项目“我与老师在智慧平台上的互动次数增加”的回答，有 50.98% 的学生选择非常赞同，35.29% 的学生选择赞同，8.82% 的学生选择一般，有 2.94% 的学生选择不赞同，有 1.96% 的学生非常不赞同；对于第三个小项目中，学生认为“我喜欢的智慧平台教学辅助功能有”扫码签到（29.41%）、投票（74.25%）、弹幕互动（86.27%）、试卷测试（19.61%）、课件学习问题反馈（37.25%）、语音讲解（30.40%）、没有（0%）。这说明，就学生在课堂中的参与度而言，多数同学能够及时完成智慧平台发布的学习任务，与老师在平台上的互动次数增加，最喜欢的智慧平台教学辅助功能是弹幕互动和投票。

第四，在学习效果评价方面，本问卷总共设计了七个小项目，其中前六个小项目提供了五个选项，最后一个小项目提供了六个选项。对第一个小项目“通过在混合式大学综合英语智慧课堂课内与课外的学习，我提高了对知识掌握程度”的回答，有 51.96% 的学生选择非常赞同，40.20% 的学生选择赞同，7.84% 的学生选择一般，没有学生选择不赞同和非常不赞同；对第二个小项目“混合式大学综合英语智慧课堂能够帮助我及时发现学习中的问题”的回答，有 47.06% 的学生选择非常赞同，43.14% 的学生选择赞同，3.92% 的学生选择一般，有 2.91% 的学生选择不赞同，有 1.01% 的学生非常不赞同；对第三个小项目“我认为混合式大学综合英语智慧课堂的考核方式是合理的”的回答，有 31.37% 的学生选择非常赞同，38.24% 的学生选择赞同，19.61% 的学生选择一般，有 7.84% 的学生选择不赞同，有 2.94% 的学生非常不赞同；对第四个小项目“我认为混合式大学综合英语智慧课堂对于培养我独立思考的能力很有帮助”的回答，有 48.04% 的学生选择非常赞同，37.25% 的学生选择赞同，8.82% 的学生选择一般，有 3.92% 的学生选择不赞同，有 1.96% 的学生非常不赞同；对第五个小项目“通过智慧课堂环境学习后，我的创新能力得到有效提高”的回答，有 43.14% 的学生选择非常赞同，

35.30%的学生选择赞同, 14.71%的学生选择一般, 有 3.92%的学生选择不赞同, 有 1.01%的学生非常不赞同; 对第六个小项目“通过智慧课堂的学习活动, 我解决问题的能力提高”的回答, 有 40.20%的学生选择非常赞同, 31.37%的学生选择赞同, 20.59%的学生选择一般, 有 5.88%的学生选择不赞同, 有 1.96%的学生非常不赞同; 对最后一个小项目“我喜欢智慧课堂教学模式的原因有”的回答主要是教学资源更丰富(84.31%)、教学方式更新奇(80.40%)、学习压力和负担都比传统课堂小(63.73%)、布置作业个性化且在我的能力范围内(60.78%)、具有较强的针对性, 会提高学习效率(69.61%)、同学的参与度高, 课堂氛围活跃模式(65.69%)。调查结果说明, 大多数同学认为, 混合式大学综合英语智慧课堂课内与课外的学习提高了学生对知识的掌握程度, 并有助于帮助及时发现学习中的问题、培养独立思考能力和创新能力。此外, 大多数同学对混合式智慧课堂持积极态度并积极进行尝试, 希望提升智慧课堂的考核方式使其更科学全面地反映学生实际英语水平。同时, 大多数同学喜欢混合式大学综合英语智慧课堂教学模式的原因主要集中在两个方面, 即教学资源更丰富和教学方式更新奇。

综合表明, 大多数学生对混合式大学综合英语智慧课堂教学模式持积极态度, 对智慧课堂的教学设计认可度较高。在混合式大学综合英语智慧课堂实施过程中, 教学方式突破了时空的限制, 大多数同学积极参与教师组织的各项教学活动, 教学效果良好, 有利于提高学习积极性、自主性和创新能力, 满足了学生多样化和个性化的学习需求。

3.2 教师访谈

本次教师访谈以文字形式进行记录, 以问答形式收集和整理授课教师在混合式大学综合英语智慧课堂模式下的收获与体会、问题和建议, 以便进一步了解混合式大学综合英语智慧课堂的教学效果。其中四位受访授课教师经常用到智慧课堂软件中的测验功、自主学习功、抢答和任务推送等功能; 五位受访教师都认为智慧课堂对英语阅读有帮助, 学生在阅读能力、自主学习能力与合作能力等方面有较大提升; 在被问及如何提升学生的学习体验时, 授课教师一致认为应该从以下四个方面着手: 首先, 在教室方面, 教室比较小, 由于疫情防控要求, 单人单桌的座位布置让教室看起来空间不够。由于班级人数比较多, 希望可以换一间较大的教室。其次, 平板电脑上的学习资源还不够丰富, 平台应该提供更多学习资源。在教学方面, 教师要充分考虑学生的水平, 并根据学生的兴趣设计多样化的教学内容, 采用多样化的教学方法促进学生学习。除此之外, 老师还应该帮助学生养成良好的学习习惯, 让学生在在学习中感受到快乐, 实现快乐学习。最后, 老师要采取多样化的评价方式, 根据平板电脑的反馈及时给学生进行指导。此外, 有两位授课教师在访谈中也反馈了混合式大学综合英语智慧课堂存在的一些不足之处。例如, 由于智慧课堂非常强调学生在教学过程中的主体性和自主性, 毕竟大学生英语自主学习能力的培养是提升大学生英语学习效果的重要环节(王笃勤, 2002)。这容易导致教师的教学主导性和引领性在智慧课堂中存在一定削弱, 有时候学生容易因为缺乏教师合适的引导而迷茫不知所措。另外, 面对浩如烟海的教学资源和学生的不同具体情况, 选择标准难以统一, 教师在教学资源的优选方面也带有一定的主观性, 不一定能完全适合学生的实际需求和当下学习能力。此外, 教学平台应注重提升学生整体的英语能力, 关注听力、口语和写作能力的培养, 或许可以设计口语和听力在线测试的功能, 方便学生自主学习和检测听说能力。

4 结语

在当今“互联网+”的高度数字化时代，传统的线下单向输入型大学综合英语教学模式已经无法满足当代大学英语专业教学的需求，教学范式创新和变革势在必行，这触发了智慧课堂模式在大学综合英语教学活动中的兴起。无独有偶，2023年1月，广东省教育厅专门转发了教育部2022年11月发布的《教师数字素养》教育行业标准的通知，强调深入贯彻落实党的二十大精神，扎实推进国家教育数字化战略行动，完善教育信息化标准体系，提升教师利用数字技术优化、创新和变革教育教学活动的意识、能力和责任。这从另一个侧面说明，教育数字化的独特优势和创新价值已经逐渐深入人心，获得我国教育界顶层设计层面的高度认可。

智慧课堂是教育数字化的新境界，标志着我们的教学理念和教学方式迈上了一个新台阶（祝智庭、贺斌，2012）。智慧课堂以其立体化、智能化、个性化、交互性和全方位五方面的内涵特征为大学综合英语教学的实际实施提供了技术保证和理论指导。华南地区某高校近几年来采用的线上线下结合的综合英语混合式智慧课堂从英语教学实际出发，依托智慧教室和网络教学平台整合线上线下资源，培养专业素质高、国际视野宽、家国情怀深的英语专业人才。应该承认的是，该校试点的综合英语混合式智慧课堂目前仍然处于探索期，本文仅是在分析智慧课堂的内涵特征和实施路径的基础上初步考察了大学综合英语混合式智慧课堂的实施细节和师生态度，未来还可以从教学思路、师生互动、课堂反馈等多方面以辩证和发展的眼光推进这类相关研究。

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Innovation of Blended Smart Classroom for College Comprehensive English in the Era of Digital Education

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Abstract: In the era of digital education, smart classroom has become a trend. The new teaching model is tridimensional, intelligent, individual, interactive, and comprehensive, with teachers and students as the guide and the center respectively. The innovation and teaching practice at a southern university suggest that the blended smart classroom of Comprehensive English with the combination of both online and offline teaching helps to facilitate the bilateral interaction to construct a smart circular system, since it integrates class preparation, classroom activities, and after-class practice through both online and offline resources. The questionnaire for the students randomly selected from three smart classrooms of Comprehensive English and interviews with five teachers suggest that most students hold a positive attitude towards the teaching model with regard to its rich teaching resources and new teaching methodologies. Meanwhile, the interviewed teachers generally regard the new model as a useful supplement of traditional classroom, valuing its benefits for the cultivation of reading, autonomy learning and cooperative capability on behalf of the students.

Key words: digital education; blended Smart Classroom; Comprehensive English

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教师数据素养的文献综述

詹凯宇

摘要: 本文通过检索教师数据素养相关文献,对过去 20 年内的国内外期刊论文进行综述,并通过扎根理论三级编码对教师数据素养现有研究的类别做出概括,得出教师数据素养有数字教育与教师能力建设政策、数字化意识与能力、数字化应用与社会责任以及数据素养研究方法等四个方面。

关键词: 教师数据素养; 文献综述; 扎根理论

Literature Review of Teachers' Data Literacy

Zhan Kaiyu

Abstract: This paper presents a 20-year academic journal papers literature review on teachers' data literacy. With a three-level coding based on grounded theory, teachers' data literacy are discussed from four aspects: policies on teacher digital education, teachers' digital consciousness and ability, digital application and social responsibility, and data literacy research methods.

Key words: Teachers' data literacy; literature review; grounded theory

引言

目前全球已处于大数据时代,教育被认为是与数据最相关的行业,数据在教育领域的应用已经上升到国家战略层面。自党的十八大以来,国家颁布一系列政策来支持教育和大数据的结合。教育部党组书记、部长怀进鹏在 2022 年全国教育工作会议等多个场合提出,实施教育数字化战略行动,推动实现教育数字化转型。教育数字化转型的目标之一就是教师的数字化能力培养,即数据素养。中小学教师每天需要接触大量数据,但大多缺乏相关知识和能力去处理这些数据并转化为教学行动,因此对于教师是否具备数据素养提出了新要求。本文基于过去 20 年内的国内外期刊论文检索,对教师数据素养相关主题进行综述,以期能从中得出对未来我国教师数据素养发展研究的启示。

问题的提出

教师数据素养是近几年教育数字化转型过程中提出的一个新兴概念,目前仍有很多人对于这一主题不太了解或了解的不太全面。本文通过对已有文献进行综述,使得读者对于教师数据素养的现有研究做一定的了解,为未来教师数据素养这一主题的研究提供新的方向。

本文的研究问题有以下两个:①教师数据素养的内涵是什么?②教师数据素养现有的研究领域有哪些?

教师数据素养的内涵

对于教师数据素养这一概念,不同的学者有着不同的界定,仍尚未有统一的定义。本文将具有代表性的一些定义进行了罗列(如表 1),力求读者对于这一概念有更

深的认识。

表 1 教师数据素养定义

作者	对教师数据素养的定义
Mandinach&Gummer (2013,2016)	教学中的数据素养是指通过收集、分析和解释所有类型的数据，将信息转化为可操作的教学知识和实践的能力。
张进良 (2015)	数据素养主要指教师在数据的采集、组织和管理、处理和分析、共享与协同创新方面的能力，以及教师在数据的生产、管理和发布过程中的道德与行为规范。教师数据素养由数据意识、数据能力和数据伦理三大部分组成。
郝媛玲 (2016)	数据素养的内涵是指具备数据意识，并对数据具有批判性思维，能够有效且恰当地获取、分析、处理、利用和展现数据。
刘雅馨 (2018)，林秀清 (2020) 等	教师的数据素养是教师在接触教育数据时所体现出来的一种综合能力，它包含数据意识与态度、数据基础知识、数据核心技能以及数据思维方法四个方面。
傅妍 (2019)	数据素养概念伴随着大数据的产生和快速发展而产生，其最初是和信息素养的研究结合在一起。教师数据素养的核心内涵在于数据处理的基本能力与数据的教学应用能力；教师数据素养在促进基于数据的教学思维变革、教学实践改进、教学交流与技术整合等方面具有重要功用，具体包含：数据意识、数据采集、数据分析与处理、数据管理、数据使用、数据伦理等几方面。

现有的研究中，很多学者对于教师数据素养的概念是以 Mandinach&Gummer 的为基础进行的补充说明，对于数据素养的界定主要集中在教师能力层面。不同点在于对教师数据素养的要素概括中，学者张进良 (2015) 提到了数据使用的道德及行为规范，以及学者刘雅馨 (2018) 提到的数据基础知识和数据思维方法等。综上所述，笔者认为教师的数据素养是指通过数据的收集、处理、分析、解读和反思，将数据信息转化为教学行为，需要教师具有相关的意识、态度、知识和使用数据的能力，以及数据使用的道德和行为准则。

教师数据素养的研究领域

4.1 本研究通过在中国知网、Web of Science 和 Sci-hub 等上面以“教育大数据；教师数据素养；teacher data literacy；data use；data-driven decision making”等作为关键词进行有关教师数据素养的文献检索。其中在知网中对中文文献进行了 15 年-23 年核心期刊的检索、对 SSCI、SCI 期刊进行了高级检索，在 Web of Science 数据库中筛选了 2010 年之后的文章进行检索，找到中英文文献共 27 篇，然后采用滚雪球方法追踪所选文献的参考文献，总计获取的中英文文献共 105 篇。其中 33 篇来自于知网，72 篇来自于 Web of Science，具体情况如表 2 所示。

本文将采用 NVivo 软件对所搜集的文献进行三级编码分析，获得关于教师数据素养现有的研究领域。

表 2

主题	文献来源	论文数量
教育大数据研究热点	知网	1
教育数据素养影响因素	web of science	5
	知网	3
教师数据素养模型构建	知网	5
	web of science	16
教师数据素养概念	web of science	2
我国教师数据素养现状	知网	6
教师数据素养发展路径	知网	18
	web of science	49
总计	105	

4.2 数据整理和分析

本文使用 Nvivo 12 质性分析软件进行三级编码，将 105 个案例进行编码整理分析，共建立了 193 个节点，其中 177 个一级编码节点，12 个二级编码节点，4 个三级编码节点。具体过程如下：

开放性编码（一级编码）。表 3 显示了笔者对部分原始文献资料进行开放性编码的过程。表中呈现了文献名称及作者、发表期刊与时间、原始资料内容以及开放性编码结果等 4 个部分的内容。笔者根据数据的基本概念以及所研究问题的关键词对原始文献进行概括总结，如 2022 年张黎等人发表在教育学术月刊上的文章《中小学教师数据素养的影响因素与提升路径——基于混合研究方法的实证分析》，笔者将原文中‘面向中小学教师开展混合研究，挖掘影响教师数据素养发展的主要因素’的关键词“中小学教师、混合研究、数据素养影响因素等”提取出来，进一步概括为‘针对教师数据素养影响因素的混合研究’，使得内容更加简化。

根据表三概括的方式对文献进行进一步概括总结，抽象出 177 个一级编码（如表 4）。表 4 呈现了 177 个一级编码，笔者将所编一级编码进行大致分类，分为四大主题区域：研究方法相关内容；教师数据意识和能力相关内容；理论框架模型相关内容；政策要求相关内容。从各主题区域数量来看，研究方法相关内容最多，占 55 个，接下来是理论框架和数据意识能力等内容，分别是 54 和 53 个，最少的是政策相关内容，仅有 15 个。

表3 开放性编码过程表（部分）

文献名称及作者	发表期刊及时间	文献资料	开放性编码（一级编码）
大数据时代教师数据素养的现状与提升策略研究——基于杭州市中小学教师实证调查研究 傅妍	现代教育技术 2019	教育部在“全国中小学教师信息技术应用能力提升工程”和《教育信息化“十三五”规划》中均对教师利用现代信息技术手段“开展学情分析与个性化教学”提出明确要求。	教育部对教师利用信息技术进行教学的能力提出明确要求
中小学教师数据素养的影响因素与提升路径——基于混合研究方法的实证分析 张黎；赵磊磊	教育学术月刊 2022	面向中小学教师开展混合研究，挖掘影响教师数据素养发展的主要因素	针对教师数据素养影响因素的混合研究

表4 177个一级编码表（部分）

一级编码	数量
研究采用定量分析和质性分析相结合的数据分析方法 定量质性分析相结合进行数据分析 用 spss 进行数据分析 针对教师数据素养影响因素的混合研究 顺序探究型设计策略 问卷量表 实验研究法 中小学教师数据素养影响因素的质性访谈 基于扎根理论的访谈 案例分析 课堂视频记录并编码	55
改变教师信念：教师数据改进的根本挑战 提升自我效能感 教师数据素养培养的复杂性 城乡地区的教师数据使用能力的发展存在显著差异 数据分析与处理素养现状 数据采集素养现状 数据管理素养现状 教师利用数据解决教学问题及分享交流能力较好 教师数字化意愿的重要性 影响数字化意愿的因素	53
KSAO 模型 教师数据素养框架 教师数据素养能力评价体系 教师数据使用行为模型 教师数据素养教育层次模型	54

数据驱动决策能力建设框架
 数据决策的八步骤模型
 提升教师数据素养的系统框架
 远程教育教师数据素养能力模型

.....

教育部对教师利用信息技术进行教学的能力提出明确要求 15
 国家政策对教师数据素养的要求
 我国政府对数据使用的重视
 智慧教育背景下对教师使用数据的要求
 教师数据素养的提升意义

.....

总计 177

主轴性编码（二级编码）。旨在找到并确立各个概念类属之间的联系，将开放式编码有机地整合、连接在一起。

笔者根据编码的一致性和关联性原则，通过对一级编码的内容及主题进行大致分类，划分为研究方法相关内容；教师数据意识和能力相关内容；理论框架模型相关内容；政策要求相关内容等四个不同部分（如表 4），在表 4 的基础上进一步删选、合并和分类，具体过程如将表 4 第一部分中的同类型表述（定性定量分析、混合研究等）进行删减整合，归为混合研究；将问卷、访谈等不同的研究方法划分为量化研究和质性研究。最终形成了 12 个二级编码（如表 5）。

表 5 显示了部分开放性编码概括总结为主轴性编码的过程。表中呈现了主轴性编码结果与开放性编码两部分内容。将开放性编码中的问卷法、实验法等进一步概括为量化研究；将访谈、案例分析、编码等进一步概括为质性研究；将顺序探究策略、定量定性相结合进一步概括为混合研究。

表 5 主轴性编码表（部分）

主轴性编码（二级编码）	开放性编码
量化研究	调查问卷法 实验研究法
质性研究	中小学教师数据素养影响因素的 质性访谈 案例分析 课堂视频记录并编码
混合研究	针对教师数据素养影响因素的混 合研究 顺序探究型设计策略 定量质性分析相结合进行数据分 析

选择性编码（三级编码）。经过归纳总结，核心概念类属为教师数据素养研究领域，最后集中抽象出来了 4 个核心编码（如表 6），为之后的研究提供理论要点。表 6 显示了关于概括总结 4 个选择性编码时获得的一些数据。表中比对了四个核心编码所涉及的文献数量以及参考点。根据文献数量，清晰地表明数字化应用与社会责任主题被提及的最多，共有 29 篇文献；而根据文献中的参考点，即一篇

文章中相关的话题或段落，数字化意识和能力主题被提及的次数更多更密集，共有 318 个参考点。数字化应用与社会责任被提及的文献最多，共 29 篇。接下来是教师数据素养研究方法和数字化意识与能力，分别是 26 和 23 篇。四个核心编码中所涉及文献最少的主题是相关的政策，仅有 20 篇。在各个文献的参考点中数字化意识和能力最多，共 318 个，而数字化应用与社会责任位列第二，剩下的方法和政策两个主题均低于 200 个参考点以下。

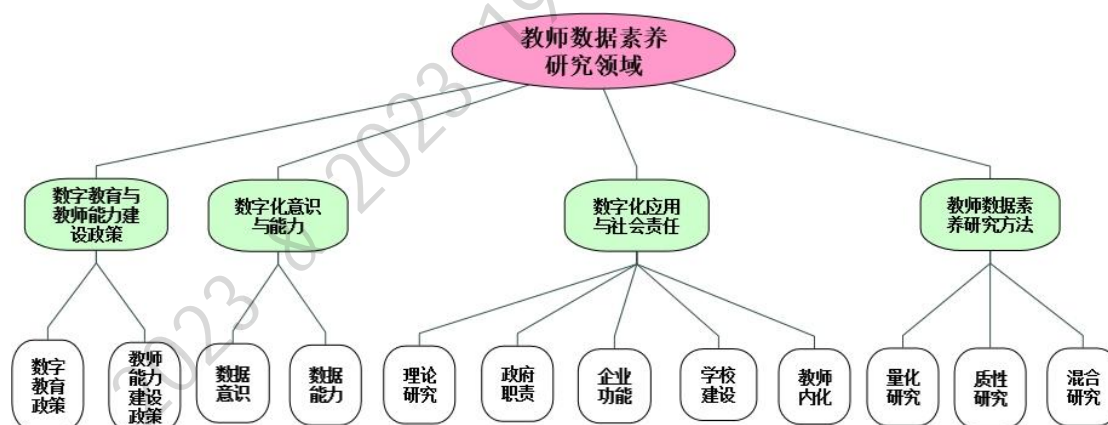
编码具体过程通过分析 12 个二级编码主题，如主轴编码部分（表 5）概括出的量化研究、质性研究和混合研究三部分内容，进一步概括总结为教师数据素养研究方法。以此类推，归纳出其它三个核心编码。

表 6 选择性编码表

名称	文件	参考点
数字教育与教师能力建设政策	20	109
数字化意识与能力	23	318
数字化应用与社会责任	29	305
教师数据素养研究方法	26	180

通过三级编码发现教师数据素养现有的研究领域包括数字教育与教师能力建设政策、数字化意识与能力、数字化应用与社会责任以及数据素养研究方法等几个方面（如下图所示）。

教师数据素养研究领域示意图



教师数据素养相关研究的领域包括数字教育与教师能力建设政策、数字化意识与能力、数字化应用与社会责任和教师数据素养研究方法，其中数字教育与教师能力建设政策包含数字教育政策和教师能力建设政策。数字化意识与能力包含数据意识和数据能力。数字化应用与社会责任包含理论研究、政府职责、企业功能、学校建设和教师内化。教师数据素养研究方法包含量化研究、质性研究和混合研究。

4.3 教师数据素养研究领域理论的构建

下面将依据具体的文献，对四个核心编码所含内容展开分析与讨论，以确定上表构建的可信性。

数字教育与教师能力建设政策

对于一个国家的任何举措，政策都是引领。政策层面的引领驱动，使教育领域持续关注教师的数据素养发展（邹逸，2020）。笔者从所读文献中的政策内容着手，将这一部分概括为数字教育政策和教师能力建设政策两部分。

1) 数字教育政策

国外尤其是美国，是这一领域的领军人物，颁布了一系列政策法规来支持教师数据素养的发展。2001年，美国在《不让一个孩子掉队法案》中明确指出大数据之于教学实践的重要价值。2002年，美国教育部与教育科学研究所联合颁布了《教育科学改革法》，重申数据在教育实践中的重要性。美国教育部在2012年10月发布了《通过教育数据挖掘和学习分析促进教与学》报告。2015年，美国政府在《让每一个孩子成功法案》中再次强调教师的教育教学活动需融入相关数据的指引（转引自邹逸，2020）。如今美国教师数据素养发展已进入完善期（张进良，2015；Reeves, T. & Honig, S., 2015；李新，2019）。

对比美国教师数据素养的迅速发展，我国相对迟滞。我国国家发改委关于组织实施2012年高技术服务业研发及产业化专项的通知提出“支持数据分析软件开发和服务创新以及数字内容相关服务”（发改办，2012）。国务院在2015年颁布的《促进大数据发展行动纲要》中明确“推动大数据发展和应用，在未来5至10年打造精准治理、多方协作的社会治理新模式，培育高端智能、新兴繁荣的产业发展新生态”（国务院，2015）。2018年，教育部制定的《教育信息化2.0行动指南》提出“主要任务包括：教育资源公共服务平台和教育管理公共服务平台实现融合发展。实现信息化教与学应用覆盖全体教师和全体适龄学生，数字校园建设覆盖各级各类学校”（教育部，2018）。2020年10月13日，《深化新时代教育评价改革总体方案》强调“要利用大数据等现代信息技术，创新评价工具等举措”（国务院，2020）。

2) 教师能力建设政策

除数字教育政策外，国家政策在数字化转型过程对教师能力层面提出了明确要求。美国政府2009年颁布的《美国复兴和再投资法案》明确指出“发展数据解读与使用技能”是教师专业发展的重要内容。我国教育部在2014年发布了《中小学教师信息技术应用能力标准（试行）》，指出要“根据我国中小学校信息技术实际条件的不同、师生信息技术应用情境的差异，对教师在教育教学和专业发展中应用信息技术提出了基本要求和必要性要求”（教育部，2014）。2017年，国务院颁布的《国家教育事业发展规划“十三五规划”》中“教育质量全面提升”这一主要目标明确指出“教师素质需要进一步提高”（国务院，2017）。2018年，中共中央、国务院印发了《关于全面深化新时代教师队伍建设改革的意见》，强调“各级党委和政府要从战略和全局高度充分认识教师工作的极端重要性，把全面加强教师队伍建设作为一项重大政治任务和根本性民生工程切实抓紧抓好”（国务院，2018）。2019年，教育部在《教育部教师工作司2019年工作要点》中指出，要“大力推动教师专业发展。实施义务教育“三科”教材和高中新课程国家级培训。启动中小学教师信息技术应用能力提升工程2.0”（教育部，2019）。

综上所述，随着智能化时代的到来，教育领域与数据紧密结合，国家对此非常重视，甚至提升到战略地位。与此同时，对于教师的教学能力也有了更高的要求，需要教师不断适应时代变化，积极主动地学习新的知识，不断提高自身专业素养。

数字化意识与能力

教师数据素养这一概念中，很多学者对其构成要素的概括主要包括数据意识，数据能力以及数据伦理等等，也有学者将数据伦理部分也纳入到数据意识中，因此笔者将这一部分概括为数据意识和数据能力。

1) 数据意识

培养教师的数据意识是培养、提升教师数据素养的首要任务（孟琪璐，董建文，2020；胡斌武，等，2019）。教师具备数据意识是教师数据素养的前提，它是指教师在教学实践活动中接触有价值数据时的敏锐性反应，从数据的角度感知、理解和评价教学行为（王正青，等，2018；刘雅馨，等，2018；廖喜凤，等，2019）。刘雅馨（2018）等学者认为教师数据意识应包括：①数据敏感度。突破“数据=成绩”的局限，对所有教育数据有一定的敏感度。②数据价值意识。肯定教育数据的价值，明确教育数据对社会的影响和作用。③数据保存与辨别的意识。对教育教学中的数据有即时、合理保存的意识，对数据质量、可信度有辨别和评估的意识。④数据更新与共享意识。明白教育数据具有时间效应，要具备数据更新和共享意识，将教育数据价值最大化。⑤数据安全与保密意识。教育数据具有一定的隐私性，教师还要有数据保密意识，对数据安全有一定的警惕性（廖喜凤，等，2019）。经过部分学者对教师数据意识探究的数据表明，绝大多数教师已经意识到数据素养的重要性，并对数据知识和数据处理技能有强烈的学习愿望和需求（郝媛玲，沈婷婷，2016）。但我国个别教师呈现数据意识不足、缺乏数据的敏锐洞察力的症状，缺乏数据使用自信，仍以传统的观念和习惯来指导自己的数据管理活动，甚至对大数据功效产生质疑（宋乃庆，郑智勇，周园林翰，2021）。

2) 数据能力

数据能力是数据素养最重要的构成要素和表现方面，数据能力指获取、分析、解读和交流等数据处理能力，以及发现、处理教学问题和基于数据进行决策的数据应用能力，是教师数据素养的核心（郝媛玲，沈婷婷，2016；王正青，等，2018；孟琪璐，董建文，2020）。学者宋乃庆（2021）认为部分教师知识储备陈旧，从海量的数据中进行科学地分类、处理、挖掘信息的技能羸弱，对先进数据管理方法和手段的了解程度偏低，直接阻碍获取和创造更大数据价值和科学财富，将成为今后开展数据素养教育和数据服务工作亟待解决的重要议题。

不管是数据意识还是数据能力方面，出现问题的原因很有必要搞清楚以指导未来实践工作的展开。学者 Barnes, Nicole 等（2019）认为个人因素（即自我效能感）、文化因素（即学校文化支持）和政治因素（即校长等权威人士），都会影响到教师的数据意识。林秀清（2020）等学者认为教师数据素养的发展，受政策支持、专家引领、资源配置、教育培训、教学实践与交流、同伴互助、教师自主学习等多方面因素的影响。罗九同（2022）等人认为数据特征、学校组织特征、用户特征、团队特征和技术特征是影响教师数据素养的五大维度。

综上所述，数据意识和数据能力作为教师数据素养最为重要的两个构成要素，对教师数据素养的发展至关重要，但教师数据素养意识不足，能力羸弱的现状更应引起重视，采取相应的措施加以解决。从现有分析教师数据素养影响因素的文献来看，主要可以概括为教师主观因素以及客观环境因素两个大的方面，未来教师数据素养的培养可针对这两方面加以改进和完善。

数字化应用与社会责任

在数字化转型时代，如何利用好数据，发挥数据的最大价值是我们需要不断探索的命题。不仅需要教师利用好大量的教育数据来改进教学，同时需要社会各界加

以辅助，承担起相应的社会责任。根据文献内容，笔者将其划分为理论研究、政府职责、企业功能、学校建设和教师内化五部分。

1) 理论研究

Marsh (2012) 等设计了一种数据驱动教学的指导框架，用来干预教师的教学实践。数据驱动决策能力建设框架是教师数据素养能力的理论基础(李青,任一姝, 2016), 该框架指出教师利用数据的主要步骤包括: ①获取和收集数据; ②组织、过滤和分析数据; ③将分析结果转化为有效信息; ④结合专业知识和认知能力将信息转化为教学知识; ⑤运用数据改进教学策略; ⑥评估教学活动的有效性 (Mandinach&Gummer, 2013; Reeves, T. & Honig, S., 2015; 李新, 2019; Jiutong Luo, 2022; 胡艺龄, 2022)。2016年, Mandinach 根据美国教师数据素养发展历程和数据驱动决策框架构建了教师数据素养框架, 该框架将教师、数据、教学等关键点结合起来, 包含了确定问题、使用数据、将数据转换为信息、将信息转换为决策和评估结果等五个维度, 每个维度都可分解为具体技能, 共 53 种 (李新, 2019; 李艳, 刘淑君, 2020)。2018 年刘雅馨提出了包括意识态度、基础知识、核心技能、思维方法四个层面的教师数据素养模型 (Athanas, 2013; 林秀清, 2020)。2022 年张学波在系统梳理国内外 DDDM 相关研究的基础上, 从教师数据素养牵涉的心理因素、包含的能力体系以及相应的数据应用实践支撑机制出发, 设计了提升教师数据素养的系统框架, 从心理、知识、能力以及实践层面提供了一个整合性框架, 拟为后续教师数据素养培育落地实践研究提供系统性的行动指南。

2) 政府职责

政府发挥领导作用, 推动教师数据素养发展 (李新, 2019)。政策制定者在政府层面可以督促教师数据素养教育相关体制的形成, 为提升教师数据素养提供可操作策略 (杨文建, 2017)。阮士桂 (2016) 认为应加强政策引导, 将数据素养纳入教育领域的话语空间。其他一些学者认为政府应加大资金技术支持, 优化资源配置, 制定教师数据素养能力培养的标准, 既要考虑学科间的差异性又要考虑区域间的协调性, 尽量让不同地域、不同学科的教师有有效的参照系, 并将这一能力纳入教师资格考核及绩效考核, 提供职前职后的相关培训 (Reeves, T. & Honig, S., 2015; Dunlap, K. & Piro, J., 2016; Mandinach & Gummer, 2016; 李青, 2018; 傅妍, 2019; 李宝庆, 2019; 杨莹莹, 2020; 邹逸, 2020; 张学波, 2022; 胡艺龄, 2022; 赵阅, 2023)。

3) 企业功能

企业应当好社会责任的承担者。企业是大数据技术的研发者, 是“大数据+教育”的推动者, 也是教育数据的争夺者, 终将是教师数据素养水平提升的受益者, 有责任和义务激发教师数据意识、提升教师数据使用技能、增强教师数据管理能力。同时, 企业要做好数据安全的防护者, 推进“校-企-师”数据安全防护共同体建设 (傅妍, 2019)。同时, 企业应保持智能教学产品的研发, 例如微软亚洲研究院基于《我的世界》游戏平台构建了一系列英语学习课程和工具, 名为“我的世界单词大冒险”, 将游戏化感受赋予教学实践, 使得未来各类技术与教学结合成为可能。企业可进一步开发基于学科知识图谱的智能教学产品。知识图谱在智能搜索、自动问答、智能推荐、智能决策等方面发挥关键作用, 能大幅提升教学智能化水平 (王定华, 杨丹, 2023)。

4) 学校建设

学校是教师数据素养能否得到可持续发展的重要影响因素 (李新, 2019)。学校

领导的战略框架制定和主观行动意愿是增加教师参与数据驱动实践的关键(张学波, 2022)。张学波等认为学校应为教师提供跨学科融合性的综合培训课程, 其内容可以涉及教育评估、统计学、教学心理学、教育学、差异心理学和课堂管理等多个范畴(Reeves, T. & Honig, S., 2015; Dunlap, K. & Piro, J., 2016; Mandinach & Gummer, 2016; 傅妍, 2019; 陈曦, 2020; 宋乃庆, 2021)。学者李青(2018)认为对教师数据素养的教育中, 团队合作学习已经被证明是有效的方式。学校需鼓励教师在应用多种类型教育数据的过程中开展协同合作(王正青, 2018; 邹逸, 2020; 杨莹莹, 2020; 张黎, 2022; 胡艺龄, 2022)。除对教师展开培训外, 学校层面应构建数据校园文化, 建设数据素养环境(Jeffrey C. Wayman, 2013; Mandinach & Gummer, 2016; 阮士桂, 2016; 傅妍, 2019; 李新, 2019; 李宝庆, 2019; 张黎, 2022)。最后, 李新(2019)等认为应将数据驱动决策视为持续的系统过程, 学校要定期组织教师开展相关理论与技术的交流学习, 并长期监测、评估教师的数据使用情况(邹逸, 2020)。

5) 教师内化

数据素养教育必须依靠教师自身, 从教师自身出发, 发挥教师的内化作用(傅妍, 2019)。面对数据时代的知识老化和本领恐慌, 教师需要在知识技能、情感认同、道德意志、行动能力四个方面协同展开, 增强数据知识、数据分析、数据灵活运用等方面的能力, 加强自身的数据意识和数据敏感度(阮士桂, 2016; 李青, 2018; 李新, 2019; 张学波, 2022; 赵阅, 2023)。教师还应充分发挥自身的分布式领导潜能, 主动探索与挖掘实施数据协作的有效模式, 积极与其他教师交流数据整合、数据采集、数据处理的实践经验, 分享数据分析软件的操作技巧, 通过与其他教师的对话来协同实现教育目标(胡艺龄, 2022; 张黎, 2022)。

综上所述, 教师数据素养的发展及应用需要理论构建, 更需要政府、企业、学校、教师共同努力。通过理论研究, 构建教师数据素养的内涵及其培养的理论框架, 从而为提升和评估教师数据素养提供基础。发挥政府引领作用, 在资金及技术方面提供支持和优化; 发挥企业推动作用, 教育防护双向互动; 发挥学校建设作用, 文化评估双管齐下; 发挥教师内化作用, 知情意行四维展开, 是落实提高教师数据素养的保证。

数据素养研究方法

近些年来, 我国教师数据素养研究中的实证研究越来越多, 笔者根据所读文献将文献所用研究方法概括为三大类别: 量化研究、质性研究和混合研究。

1) 量化研究

已有研究中使用量化研究的主要有以下两种方法: 调查问卷法、实验研究法(由多到少依次排列)。现有研究使用最多的是问卷调查, 美国学者韦曼等人于2009年开发的教师数据使用调查问卷被应用在多项研究中, 信效度已得到较好的验证(李艳, 2020)。隆茜(2015)以有科研需求的大学教师、博硕士研究生及本科生为调查对象。问卷内容分为两部分, 第一部分为被调查者的个人信息, 第二部分为文章构建的数据素养能力评价指标体系的调查。胡艺龄(2022)所使用的调查问卷分为数据素养调查问卷和课程满意度问卷, 其中数据素养调查问卷改编自杨现民团队(2020)编制的《教师数据素养自我评价量表》, 共40个题项涵盖教师数据素养评估的四个层面(林秀清, 等, 2020)。其次是实验研究, 美国学者Mandinach(2015)一项研究的调查部分包括对美国所有学校或教育部门进行的分层随机样本。干预措施以德国南部一所大型大学的职前中学教师的三

个教育课程为研究对象进行随机对照试验,所有课程参与者随机分为对照组和实验组(Mandinach, E.B., Friedman, J.M., & Gummer, E.S., 2015)。学者胡艺龄(2022) 2019年在暑期华东地区某大学开展的一次中小学骨干教师数据素养培训课程上展开实证研究,采用对照实验研究方式将整个班级随机分配为实验组与对照组。在两个组别中分别提供共享调节支架和自我调节支架,均采用本研究设计的教学模式进行教学,以研究该教学模式对教师数据素养培养的作用。

2) 质性研究

已有研究中使用质性研究的主要有以下几种方法:访谈、案例研究和内容分析法。国外研究者开发了针对教师数据素养的另一种测评工具:情境访谈(Means, 2011)。情境访谈工具包括模拟情境、一套数据文件和一组问题。访谈人员依据情境访谈内容展开调查。通过对访谈结果进行数据分析,研究者综合评估教师数据素养。Supovitz等人(2009)在对16名高职教师的访谈中发现,很多老师在协作中的参与效果不佳(胡艺龄, 2022)。学者李艳(2020)在某师范学院实施一项案例研究。该学院的五名教师组成数据探究小组,合作研究学生辍学问题。课题组成员对数据小组参与者进行跟踪,着力研究参加数据探究小组活动如何影响教师的数据素养。学者胡艺龄(2022)的研究中对课堂进行视频录制并进行内容分析,教学活动视频采集于教学活动发生的各个阶段,主要用于记录各小组成员在学习过程中的学习行为轨迹、组内对话和小组协作讨论情形。

3) 混合研究

Anderson(2010)等人采用的混合方法研究是关于领导力如何影响学生学习的五年项目的一部分,包括对教师校长的问卷调查及访谈,和案例研究基于采访地区领导人,学校管理员等获得数据。Farley-Ripple等(2014)学者的研究采用了顺序混合方法,其中包括访谈、观察和文件分析,数据收集于2010-2011学年,来自特拉华州两个学区的四所小学。学者张黎(2022)的研究采用顺序探究型设计策略开展混合研究,即“利用量化的数据和结果来补充和说明质性研究的结论”。首先,研究采用质性访谈的方法。其次,在借鉴韦曼(2009)和杨现民(2020)团队的量表编制问卷,对各地中小学教师进行问卷调查。

综上所述,已有研究中问卷调查和访谈的研究方法被用得最多,学者们也已经开始了新的研究方法的尝试,现有文献对于混合研究方法的使用还不是很多,未来研究在进行实证研究的基础上可以向这一方向靠拢。

总之,本文构建的教师数据素养研究领域理论包括4个不同的领域,即数字教育与教师能力建设政策、数字化意识与能力、数字化应用与社会责任和教师数据素养研究方法,每个领域又包含不同的方面,共12个。根据对以上四个编码内容的具体分析与讨论,每一个编码对应的各部分内容都有各自大量中英文文献的支撑,因此教师数据素养研究领域理论得到了很好地验证,是合理的且具有可靠性。

研究局限和启示

纵观以上教师数据素养的相关研究,这一主题的研究正在逐步得到完善。但仍然存在一些未研究到或研究较少的领域值得我们去进一步探索,也为未来我国教师数据素养的研究提供了新的启示和方向。

从概念来看,缺乏对教师数据素养概念的深度解析。

已有文献中,不同学者对于教师数据素养都有不同的解释,但大体意思相近,偏向于能力层面。且对于教师数据素养概念界定的理论性文章较少,多是作为部分内容被提及。对于概念的理解是我们进一步研究的前提,尤其是数据素养作为近

几年的新提法，容易与其他概念混乱，从而影响到政策制定和进一步发展。我们需要对教师数据素养的内涵及要素进行持续的研究与界定，促使人们对教师数据素养的理解走向深入。未来的研究可以继续深入探讨教师数据素养这一概念，并将这一概念与其他有联系的概念，例如：数字素养、信息素养、评价素养、统计素养等做好汇总并区分。

从政策来看，缺少对于政策能否落到实处的监督和有效干预。

近些年来，国家十分重视教师数据素养的发展，也提出了一系列支持的政策，但在实际中小学教学中成效不显，有的教师仍仅仅认为能讲好一节课就够了，对于国家地方学校组织的相关培训也只是流于形式，没有引起足够的重视。未来的研究可以进一步探索如何加强政策的落地，如何引起教师对于一些新政策的重视程度。

从意识能力来看，缺少对于主观影响因素的探究。

一个国家某一方面的发展存在一些问题，探究影响因素是很必要的。但现有研究仅有几篇讨论教师数据素养影响因素，且大部分偏向客观环境因素，主观因素方面的探讨仅局限于教师自我效能感的影响。因此，未来的研究可以从实际情况出发，通过不同的视角进一步探索我国教师数据素养意识和能力不足的原因。

从应用来看，缺乏理论与实践的一致性。

我国从美国教师数据素养发展的经验中，学习借鉴到了很多培养方式，我国学者也据此提出了很多关于我国教师数据素养发展的建议，但是否在人口众多，地域辽阔的国家能得到普遍实施，仍未有定论。现有方案的可行性和成功率有待进一步考察，不同区域及学科，不同性别、年龄的教师如何差异化发展数据素养更有待进一步研究。

从研究方法来看，缺乏多元化的研究。

现有的研究中对于一些理论框架的使用，大多是直接套用美国的数据驱动决策能力建设框架，缺乏一定的创新。我国的实证研究也较少，实证研究难度较大，还需考虑经费，疫情因素影响等问题，进入中小学实地考察比较困难。所以，未来的研究在理论方面，可以建立新的数据素养框架或模型，用以指导教师数据素养的评估与提高。在实证研究方面，已有文献较多使用问卷调查及访谈的形式，未来研究可以采取更多混合研究的方式展开，尝试使用除这两种以外的其他研究方法，力求数据的信效度，为我国教师数据素养发展提供切实可行的方案。

总而言之，教师的数据素养作为教育数字化转型过程中的关键，值得我们去进一步深入的研究。不管是以上哪个方面，将理论转化为现实才能切实发展我国教师的数据素养。

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ChatGPT在英语教学和研究中的应用

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摘要: ChatGPT 的横空出世让人们人们对人工智能技术的关注达到了空前的高度。本文将结合具体的实例详细介绍 ChatGPT 在英语教学和研究中的广泛应用, 例如: 各类教学素材的快速准确查找、试卷的自动生成、作文的评判、文章翻译以及论文写作和教学研究上的各种应用。ChatGPT 可以显著提升英语教学和研究的效率。

关键词: ChatGPT; 人工智能; 英语教学; 语言研究

ChatGPT 的全称是 Chat Generative Pre-trained Transformer。它是人工智能技术驱动的自然语言处理工具, 它能够通过理解和学习人类的语言来进行对话, 甚至能完成撰写邮件、视频脚本、文案、翻译、代码, 写论文等任务。那么, ChatGPT 在英语教学和研究中有哪些应用呢? 下面我们将结合具体的实例来探讨 ChatGPT 在英语教学和研究中的广泛应用。

一: ChatGPT 辅助英语教师备课

在英语教学的备课过程中, 我们有时需要快速准确地找到教学所需的教材和例句, 特别是大学英语教师, 有时需要更广泛、更丰富的教材的时候, ChatGPT 的巨大优势就充分体现出来了。

问题 1: 请列出 3 个使用了不规则动词的英语句子。

ChatGPT 给出的问答 (下同):

1. I have been running for an hour.
2. She has been writing stories since she was a child.
3. They have gone to the store already.

问题 2: 请列出 3 个使用了定语从句的英语句子。

1. The girl with green eyes is the one I like.
2. The book which has been proved to be useful is what we are studying.
3. The table has a vase of flowers on it, which are very colorful.

问题 3: abide, adhere, conform, comply 有什么区别?

Abide, adhere, conform and comply all mean to act in accordance with a rule or standard. The difference between them is mainly one of degree: abide implies being faithful to an obligation or promise;.....

问题 4: 请详细列出 abide, adhere, conform, comply 之间的区别。

1. abide: 表示“遵守, 忍受”, 暗含有一定的时间性和义务性。
2. adhere: 表示“坚持、依附于、固守地遵循或服从”。
3. conform: 表示“遵循、服从或适应周围的情况或规则”。
4. comply: 表示“顺从、听话或效仿其他人的要求而采取行动”。

问题 5: 请用英语详细列出 abide, adhere, conform, comply 之间的区别。

Abide: To accept or act in accordance with (a rule, decision, or recommendation).

Adhere: To remain attached to something; stick to.

Conform: To comply with established standards of behavior or action.

Comply: To act in accordance with a wish, command, or agreement; obey.

以上的问题 3、4、5 的提问意思基本一样, 但你用不同的提问方式甚至用不同的语言(例如: 中文和英文)提问的时候得到的答案都不一样, 并且纯英文提问得到的答案质量更高。下面就是一个纯英文的提问和回答。

问题 6: Explain the word rusty and give me some example sentences.

Rusty is an adjective used to describe something that has been damaged by oxidation, usually due to exposure to moisture or air.....

Examples of sentences using the word rusty include:

"The old gate had become rusty from years of being outside."

"My bike chain was so rusty it wouldn't move."

"I found a rusty nail in the garden."

问题 7: 请列出含有 even 单词不同含义的 3 个句子。

1. Even though I was tired, I still managed to finish the race.
2. The number of students in this class is even.
3. She has an even temper and never gets angry easily.

问题 8: How many ways to say I love you?

ChatGPT 迅速给出 10 种以上的表达, 前 3 个表述如下:

1. I adore you.
2. You mean the world to me.
3. I'm crazy about you.

问题 9: 请出 1 道英语专业四级词汇练习题并给出答案

1. What is the meaning of "dormant"?

A: Dormant means inactive or temporarily inactive.

问题 10: 请出 1 道英语专业四级词汇练习题, 练习形式是单项选择

题，请给出答案

1. He is a _____ of the university, which means he can teach there.

- A. lecturer
- B. professor
- C. student
- D. visitor

Answer: A Lecturer

问题 11：请给英语专业的大学三年级大学生提供 1 段有关经济方面的阅读理解材料并给出 2 个单项选择题和答案。

Reading Material:

The global economy has been greatly impacted by the Covid-19 pandemic. As of July 2020, the International Monetary Fund (IMF) reported that world GDP will contract 4.9% in 2020 due to the economic fallout from the virus.....

Multiple Choice Questions:

1. According to IMF report, what is estimated for world GDP in 2020?

- A) Increase by 3%
- B) Decrease by 5%
- C) Remain unchanged
- D) Increase by 4.9%

Answer: B) Decrease by 5%.

问题 12：请给管理专业的大学生出一道英语完形填空的练习题，请给出答案。

The manager of a small business was having trouble with one of his employees. The employee had been late for work several times, and when he did show up, he seemed ___1___ and uninterested in doing the job. The manager decided to talk to him about it.(其余略，原文共 180 个左右的单词，4 个完形填空题目)

1. A) diligent B) energetic C) distracted D) responsible

Answer: C

问题 13：请给英语专业的大学三年级大学生提供 1 段 150 词左右有关环境保护的英译汉材料。

Environmental protection is an important issue for all of us. We should take responsibility to protect our environment and make sure that it remains healthy.(其余略，原文共 150 个左右的单词)

环境保护是我们所有人的重要议题。我们应该承担责任来保护我们的环境并确保它保持健康。

问题 14: 请给英语专业大学三年级学生提供 1 段有关文学方面的汉译英材料, 不超过 300 个词。

中国文学是一个源远流长的文化, 有着悠久的历史 and 优秀的作品。它以其独特的视角向人们展示了中国不同时代胞波勤劳、节俭、诚实、忠诚等优良道德, 并提供了对人生真理的思考。

Chinese literature is a long-standing culture with a long history and excellent works. It showcases to people the admirable virtues of hard work, thriftiness, honesty, loyalty in different periods of China from its unique perspective and provides reflections on the truth of life.

问题 15: 分析下面的句子的句子结构, 用表格的形式展示, 最后给出中文翻译和难词释义: Every competent writer has to know how to write a concise sentence and how to prune a long one to readable length. But a competent writer must also know how to manage long sentences gracefully, how to make it as clear and as vigorous as a series of short ones.

ChatGPT 给出的答案如下:

Sentence structure:

Subject: Every competent writer

Verb: has to know

Object: how to write a concise sentence and how to prune a long one to readable length

Subject: a competent writer

Verb: must also know

Object: how to manage long sentences gracefully, how to make it as clear and as vigorous as a series of short ones.

Chinese translation: 每一位有能力的作家都必须懂得如何写出简洁的句子, 如何将长句裁剪到可读的长度。但是有能力的作家也必须懂得如何优雅地处理长句, 如何使其像一系列短句一样清晰有力。

Difficult words:

Competent: 有能力的 Prune: 裁剪

Gracefully: 优雅地 Vigorous: 有力的.

从以上实例我们看出, ChatGPT 在辅助英语教师备课中非常实用, 它快速而精准地解决了英语教师在备课中的各种需求。只要我们提问提得好, 它就能给我们提供非常满意的答案。

二: ChatGPT 辅助英语写作教学

计算机辅助写作, 特别是英语作文的批量快速修改以及是人工智

能辅助英语教学的重要应用之一。同样地，只要我们会提问，ChapGPT就能很好地辅助我们开展英语写作教学。

1: 请对以下英语作文的错误单词进行修改

The Importance of Traditional Culture

With the *rapd* onset of *globalizaion* there is a danger of standardization where you would find businesses like Starbucks and MacDonald's everywhere replacing local companies and customs. ChatGPT 修改后的结果如下:

The Importance of Traditional Culture

With the rapid onset of globalization, there is a danger of standardization, where you would find businesses like Starbucks and McDonald's everywhere, replacing local companies and customs.

2: 根据中国大学英语六级考试的写作评分细则，请对以下的写作水平进行评估，给出参考分数范围。分数范围在 0-100 之内。先输出分数，再给予解释。

Online Purchasing

What is subtly demonstrated in the above drawing is that in front of a desktop sits a fashionable lady who is staring at the screen with shocked expression wearing on cheeks and huge sweat dropping from her forehead. What is spit from the computer is the lengthy Alipay bill, which can almost be spread as long as two meters. The caption above reads that you should keep away from Taobao and cherish your income.....(其余略, 原文共 250 个左右的单词)

ChapGPT 的回答如下: 给予这篇文章的参考分数范围为 80-90 分。该文章有明确的中心思想，表达清楚；语法正确，用词准确、且能体现出作者对所写题目的理解和把握；句式多样且有一定的变化。

3: Please write an essay that begins with the sentence "Nowadays more and more people are interested in the traditional Chinese culture." You can make comments, cite examples, or use your personal experiences to develop your essay. You should write at least 150 words but no more than 200 words.

ChapGPT 的回答如下:

Nowadays more and more people are interested in the traditional Chinese culture. This is evidenced by the increasing number of visitors to China's cultural heritage sites, such as the Great Wall, Forbidden City, and Terracotta Warriors.....(其余略, 原文共 200 个左右的单词)

4: Please write a essay on the topic "Is car sharing the future of transport?". You should write at least 150 words but no more than 200

words.

ChatGPT 的回答如下:

Car sharing is becoming increasingly popular as an alternative to owning a car. It offers many advantages, such as lower costs, convenience and environmental benefits. Car sharing has the potential to be the future of transport for both individuals and businesses alike.(其余略, 原文共 200 个左右的单词)

类似地提问还有: Please act as an English teacher and give me feedback on my writing sample, including suggestions for improvement and corrections of any mistakes. 或者: Can you provide me with a revised version of this writing sample? 等等, 这些问题都能得到 ChatGPT 的满意回答。

三: ChatGPT 辅助外国语言文学研究和论文写作

问题 1: 请用英文列出英国名著中 1 段有关人物心理描写的段落, 请说明出处。

ChatGPT 给出的答案如下:

1. "He was a man of great integrity and honour, with an innate sense of justice that made him respected by all who knew him." (From Jane Austen's *Pride and Prejudice*)

问题 2: 请列出英文版小说《简爱》中含有 eccentric 的句子

1. "Mr. Rochester was eccentric and capricious in his behaviour, often making sudden changes of plan."
2. "The whole party were astonished at the eccentricity of her conduct."
3. "He had a strong hand, a quick eye, and an inflexible will; he was eccentric too."
4. "She was not so much eccentrically odd as painfully shy"

问题 3: Please list the characteristics of Shakespeare's works

1. Complex characters: Shakespeare's characters are often portrayed as being complex and multi-faceted, with both strengths and weaknesses.(其余略, 原文共 120 个左右的单词)

问题 4: I am writing an academic paper. Can you help me draft up an outline of the following topic: What changes will ChatGTP bring to English language teaching?

ChatGPT 给出的答案如下:

1. Introduction to ChatGPT and its capabilities
2. Impact on English language teaching:

- Increased access to personalized instruction
 - Automation of grammar correction and feedback
 - AI-assisted language learning
3. Challenges of incorporating ChatGPT into English language teaching
4. Conclusion

问题 5: 对上一个问题进一步追问: Can you turn it into a 300-word essay?

ChatGPT 给出的答案如下:

ChatGPT is a powerful language model that has the potential to revolutionize English language teaching. With its ability to understand and generate natural language, it can provide personalized instruction and automated grammar correction and feedback.(其余略, 原文共 300 个左右的单词)

综上所述, 只要我们善于提问, ChatGPT 就可以显著提升英语教学和研究的效率。

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基于计算机的感知培训影响声调背景汉语学习者双音节声调的感知和产出之间的关系

西安交通大学外国语学院
李成家

摘要： 基于计算机的感知培训能够有效提高二语学习者对非母语音素在音段和超音段层面上的感知和产出。以往研究重点关注培训效果在音素或者单音节层面，双音节层面很少涉及。汉语声调是限制汉语非母语学习者口语可懂度的主要因素之一。本研究旨在探索基于计算机感知培训对泰语初学者在双音节层面的效果和培训前后感知和产出的关系以及直观对比母语者和泰语者声调的异同。实验招募了 20 名泰国被试。在前测和后测，要求被试识别双音节 16 种声调组合共 320 个词里的第一个字和第二个字的声调并且将这些词录音。在感知培训，要求被试对 6 组单音节声调组合进行学习直到完成全部等级测试。结果显示：1. 感知培训对产出的提高大于对感知的提高。2. 培训前感知和产出成强正相关，培训后相关性下降。3. 所有声调组合中，三声+三声组合在识别和产出任务的准确率和得分均低于其他组合。实验总体表明感知和产出的提升不是同步的并且感知培训会影响声调背景的泰国被试对双音节的感知和产出的关系。

关键词： 声调； 感知培训； 产出，相关性

1 引言

Yip (2002) 指出，根据音高在意思的表达上起的不同作用，世界上的语言可以分为三种，声调语言（如，汉语，泰语，越南语），语调语言（如，英语，俄语）和音高重音语言，（如，日语）。在汉语中，不同语意通过音节层面的调高和音高曲线的变化来实现的，而在英语中，音高的不同只发生在短语或者句子层面，以及在日语中，调高的不同发生在音节和音节之间 (Keke Yu, 2014)。汉语中有四个声调，阴平，阳平，上声和去声。赵 (1948) 用五度标记法把汉语声调音高变化曲线描述为调值：阴平 55，阳平 35，上声 215，去声 51。汉语非母语者的发音错误主要就集中在这四个声调。

以往研究重点关注产生错误的原因。从声学角度来看，汉语三声的转折点音域非常低，而在英语中，语调主要存在于高重音，很少有低音 (li et al., 2021)。这就导致英语母语者学习汉语时，三声的发音最难。从音高的作用来看，音高变化主要在句子层面，表达惊讶或者强调，然而在汉语中，音高变化主要在字层面，因为单音节音高的变化会产生语意的变化。如汉语单音节“ma”，读一声时为“妈”，二声时为“麻”，三声时为“马”，四声时为“骂”。从感知加工的角度看，汉语母语者存在范畴化感知并且对声调与声调之间有明显的界限，而非汉语母语者只通过简单的音高变化对声调进行区分 (Qin et al., 2019)。从稳定性来看，汉语中存在三声变调的情况。学习者都是从孤立的单音节开始，三声音节独立时发三声的音。但当三声和三声组合时，第一个三声变为二声。例如我“T3”，想“T3”，组合成“我想”时，声调变为“T2-T3” (Yip, 2002)。由此可见汉语非母语者学习声调困难是多方面的因素造成的。

为解决二语学习者的困难，学者发现实验室基于计算机的感知培训可以帮助提高学习者

对二语音素的区分。感知培训包括儿向语(infant direct speech), HVPT (high talker variability training), 适应性训练 (adaptive training) 和手势语 (explicit instruction) 等。Shinohara and Iverson (2021) 使用感知方法培训多年龄段的日语母语者对/r/-/l/的感知区分, 发现被试培训前后均有提高, 但年龄因素会影响培训效果。Chen et al., (2022) 检测了感知培训对声调背景和非声调背景的学习者学习汉语三声变调的效果, 发现两组被试的区分和识别水平高均有所提高。但其只探索了三声的情况, 并未包含所有汉语声调。这些培训方法多集中在感知层面, 产出培训层面很少涉及。Seth Wiener (2020) 在感知培训的基础上加入了产出和手势指导。但手势指导只是对声调走势的模仿, 并且被试只是对标准发音进行重复模仿, 未具体指出错误所在, 以及和母语者的发音进行直观对比。Mengtian Chen (2022) 采用了计算机辅助教学手段, 对比了计算机视觉和听觉反馈和人工纠正反馈的效果, 发现了计算机结合的视觉听觉培训效果显著。这为声调培训软件提供了新思路。但其培训方法依靠纯人工标注错误及手动操作, 虽然效果显著, 但只适用于有限的被试。除此之外, 长久以来声调感知和产出之间的关系也甚少涉及, 或者只探索了某个声调或某种组合, 对整体全部声调组合的双音节感知和产出研究较少。因此本研究重点关注的问题如下: 1) 基于计算机的感知培训对泰语初学者在双音节的感知和产出效果。2) 感知培训是否会影响泰语初学者双音节感知和产出的关系。3) 泰语被试和汉语母语者双音节声调产出的对比分析。

2 方法

2.1 被试

本实验招募了 20 名泰语为母语的被试, 8 名男, 12 名女, 年龄在 18-20 岁。全部来自西安交通大学国际教育学院的医学专业的本科生, 来中国不到一个月, 都为汉语初学者, 之前没有汉语学习经历。所有被试都是右利手, 有正常听觉和视觉。音乐训练少于 1 年。在实验前, 所有被试都要求细读并签署被试知情同意书, 并且告知在实验结束后会支付相应报酬。

2.2 实验材料

本实验一共涉及三类实验材料: 1) 16 种声调组合下的双音节词的选择。选取的词会进行词频和声韵母匹配, 尽量保证词汇常见, 并且尽可能多的覆盖汉语的声韵母。见图 1。2) 实验材料会让普通话一级甲等的老师以日常说话速度朗读并录音。录音的每一个词都会在 praat 中截取出来, 并将时长, 音高等其他声学参数设置为完全相同。截取音频用做后续 E-prime 的程序制作。3) 识别任务的 E-prime 程序编写。

汉语双音节词语发音测试 (Chinese Disyllable Words Pronunciation Test)										
Directions: Please read each of the following Chinese words once. 要求: 请朗读下列词语, 每个一遍。										
	1	2	3	4	5	6	7	8	9	10
1	kōng jiān 空间	fēng bō 风波	shāo wēi 稍微	gāo chāo 高超	zāo gāo 糟糕	fēn zhī 分支	cān jiā 参加	yīn tiān 阴天	qīng xī 清晰	yī shēng 医生
	1101	1102	1103	1104	1105	1106	1107	1108	1109	1110
2	cān cǐ 参差	mēn shēng 闷声	xūn xiāng 熏香	zōng shī 宗师	kū sāng 哭丧	chī hē 吃喝	xīng sǎo 腥臊	diào zuǎn 刁钻	chū zū 出租	zhuī jiū 追究
	1111	1112	1113	1114	1115	1116	1117	1118	1119	1120
3	jūn fǎ 军法	xiān qián 先前	biān yuán 边缘	biān yán 边沿	shēn qīng 深情	chū xué 初学	duō cái 多才	huā tǎn 花坛	fēn lí 分离	fēn jié 分节
	1201	1202	1203	1204	1205	1206	1207	1208	1209	1210
4	zhōu wéi 周围	chuī niú 吹牛	chūn léi 春雷	cōng dá 聪达	cū sù 粗俗	wēn róu 温柔	kāi mén 开门	fēi pán 飞盘	yī cóng 依从	sōu xún 搜寻
	1211	1212	1213	1214	1215	1216	1217	1218	1219	1220
5	jūn fǎ 军法	xiān qián 先前	biān yuán 边缘	biān yán 边沿	shēn qīng 深情	chū xué 初学	duō cái 多才	huā tǎn 花坛	fēn lí 分离	fēn jié 分节
	1301	1302	1303	1304	1305	1306	1307	1308	1309	1310
6	dūn shǒu 蹲守	zhēng chōng 争宠	gōu yǐn 勾引	jīng wēi 经纬	juān kuǎn 捐款	xīn kǔ 辛苦	xī běi 西北	shū juǎn 舒卷	bō zhōng 播种	qīng sǎo 清扫
	1311	1312	1313	1314	1315	1316	1317	1318	1319	1320
7	tūn bīng 吞兵	bāng zhù 帮助	shēng rì 生日	bī pò 逼迫	dī diào 低调	jiāo jì 交际	yīng jùn 英俊	shēn fèn 身份	ān shè 安设	tāng yào 汤药
	1401	1402	1403	1404	1405	1406	1407	1408	1409	1410
8	kǒu pò 报破	shā mò 沙漠	tā rì 他日	gāng xìng 刚性	bēn fàng 奔放	guā cèng 刮蹭	jiāo héng 骄横	yī lái 依赖	xiāng pèi 相配	jiā rù 加入
	1411	1412	1413	1414	1415	1416	1417	1418	1419	1420

图 1. 双音节朗读材料

2.3 过程

2.3.1 前测和后测

为对比培训效果以及感知和产出的关系变化，前测后测的任务一样。被试在前后测均接受识别任务和产出任务。

识别任务，要求被试将给定的双音节词汇的第一个汉字和第二个汉字的声调识别出来。例如，老师，“三声+一声”组合，被试识别为“三声+一声”，则在 Chronos 上按键 3 和 1，如识别为“二声+一声”，则按键 2 和 1。被试的按键依赖于其对声调感知的主观判断。预试验阶段，共有 5 个试次，被试需要在刺激呈现后 10 秒内作出按键反应。正式试验阶段，一共 320 个双音节词，每个词汇出现 2 次（男声录音和女生录音），共随机出现 620 个试次。测试时长约为 40 分钟。

产出任务，在安静的房间，指导被试启用 praat 软件的录音功能，并以平时语速大声的读出 320 个双音节材料并录音。录音时长约为 10 分钟。

2.3.2 培训

培训结合了几何声学特征扩大，高变异说话者，走势指导和适应性训练的培训方法。培训软件包含 6 组声调组合的培训。分别为：一声+二声，一声+三声，一声+四声，二声+三声，二声+四声，三声+四声。每一组声调培训包含 7 个 level。每个等级要求被试分别点击两个声调 30 次，每次鼠标点击后会出现对应声调的发音，声调走势和真人发音口型。60 次点击结束后进行测试。每个 level 后的测试包含 10 个新的单音节词，要求被试识别听到的单音节词的声调，只有当准确率达到 90% 才会进行下一等级的培训。如果小于 90%，则返回再进行各点击 30 次，结束后再进行测试。如果通过，则进行下一 level 的训练，如果失败则返回继续点击。但三次的测试无正确率的要求。随着 level 的增加，声学特征扩大会逐渐缩小，说话者的数量逐渐增多，最多四名。掌握程度高的被试每个 level 一次通过，一共做 7 次任务。掌握程度低的被试，最多做 21 次任务。被试平均培训时间约为 80 分钟。

3 结果与讨论

3.1 数据处理

感知测试的结果主要来自于对 E-prime 导出的双音节的数据分析。分析主要从按键正确率入手。双音节产出的录音会分别让两位汉语母语者打分。母语者会对每个双音节所包含的第一个字和第二个字分别打分。分值范围为 1~5 分。5 分：完全正确；4 分：比较正确；3 分：不够标准；2 分：不太正确；1 分：完全错误。2 位母语者的评分用 ICC 统计方法分别检验，检验结果分别为：双音 $r=0.745$ ，这表明两位评估者的一致性很高，可以用来做进一步分析。随后将两位母语者的得分取平均值进一步分析。检验培训前和培训后被试的感知准确率 and 产出得分提升与否，以及是否有显著性差异，采用配对样本 t 检验。感知和产出的关系则采用皮尔森或斯皮尔曼相关性检验。所有检验均在软件 R 中实现。

3.2 实验结果

3.2.1 培训效果分析

表 1.16 组声调前后测感知配对样本 t 检验结果

Tone group	Pre-accuracy	Post-accuracy	Mean difference	t-value	sd	p-value
T1-T1	0.81	0.85	0.0445	-1.579	0.126	0.131

T1-T2	0.59	0.67	0.0760	-2.062	0.164	0.053
T1-T3	0.48	0.46	-0.0120	0.288	0.186	0.776
T1-T4	0.84	0.87	0.0325	-1.263	0.115	0.222
T2-T1	0.66	0.71	0.0440	-1.139	0.172	0.269
T2-T2	0.49	0.50	0.0110	-0.317	0.155	0.755
T2-T3	0.54	0.59	0.0520	-1.064	0.218	0.301
T2-T4	0.70	0.72	0.0205	-0.469	0.195	0.644
T3-T1	0.69	0.73	0.0360	-1.532	0.105	0.142
T3-T2	0.54	0.63	0.0905	-1.266	0.319	0.221
T3-T3	0.31	0.27	-0.0420	0.577	0.337	0.584
T3-T4	0.65	0.68	0.0275	-1.284	0.095	0.214
T4-T1	0.80	0.77	-0.0240	1.161	0.092	0.260
T4-T2	0.56	0.66	0.0930	-2.313	0.179	0.032
T4-T3	0.55	0.60	0.0490	-1.128	0.194	0.274
T4-T4	0.82	0.81	-0.0105	0.277	0.206	0.822

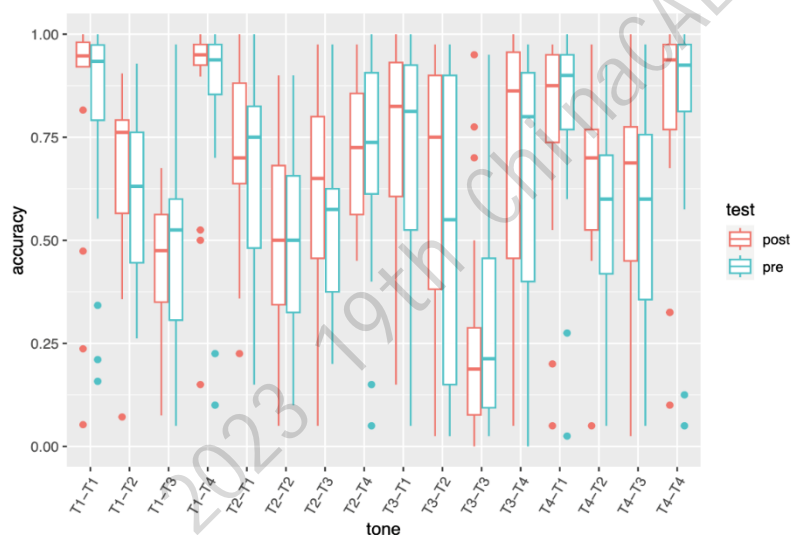


图 2. 前后测感知准确率对比

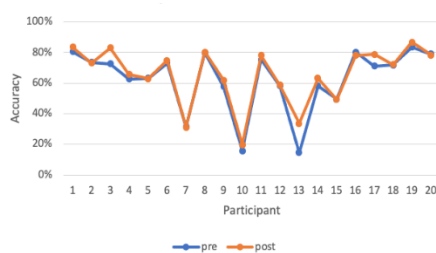


图 3. 双音节感知准确率折线图

由以上结果可知，感知在微观层面上，只有 T4-T2 声调组合在培训前后有显著性差异， $p=0.032 < 0.05$ ，其余声调组合的 p 值均大于 0.05，培训前后均无显著性变化。从后测均值减去前测均值差来看，除了 T1-T3，T3-T3，T4-T1，T4-T4 组合是差值为负，说明这些声调组合培训效果不佳，其余组合均为正值，说明这些组合培训之后在感知上略微进步。

表 2. 16 组声调前后测产出配对样本 t 检验结果

Tone group	Pre-score	Post-score	Mean difference	t-value	sd	p-value
T1-T1	73.01	73.30	0.2894	-0.088	13.893	0.931
T1-T2	66.43	71.80	5.3755	-1.952	12.314	0.066
T1-T3	59.84	69.08	9.2420	-4.089	10.107	0.001
T1-T4	73.71	74.78	1.0630	-0.431	11.019	0.671
T2-T1	64.04	68.85	4.8152	-1.944	10.795	0.068
T2-T2	59.31	65.73	6.4210	-2.239	12.825	0.037
T2-T3	52.53	65.43	12.8982	-5.597	9.502	0.000
T2-T4	66.31	72.92	6.6035	-2.273	10.845	0.014
T3-T1	66.14	71.89	5.7525	-2.598	9.901	0.018
T3-T2	60.33	67.72	7.3920	-2.293	11.274	0.009
T3-T3	50.69	64.60	13.9094	-5.919	9.970	0.000
T3-T4	69.23	74.16	4.9365	-1.972	11.195	0.063
T4-T1	75.90	76.64	0.7420	-0.325	10.214	0.749
T4-T2	69.50	72.80	3.2960	-1.188	12.407	0.249
T4-T3	64.09	71.43	7.3385	-2.937	11.172	0.008
T4-T4	76.48	75.05	-1.4200	0.423	15.008	0.677

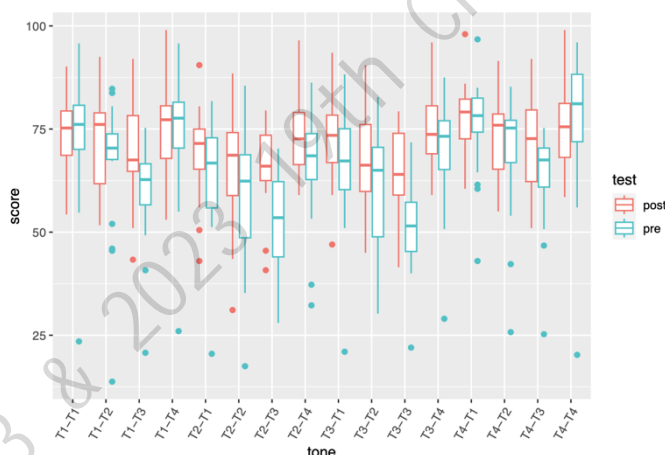


图 4. 前后产出得分对比

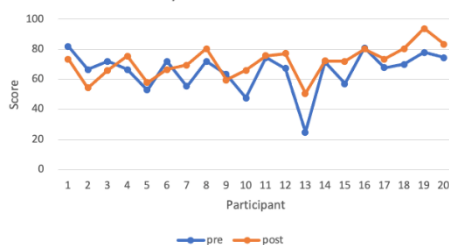


图 5. 双音节产出准确率折线图

在产出层面，培训效果显著。其中 T1-T3, T2-T2, T2-T3, T2-T4, T3-T1, T3-T2-T3-T3, T4-T3 这些声调组合培训前后有显著性差异，p 值均小于 0.05。除了 T4-T4 组合，所有声调组合在培训后得分均值都显著大于培训前得分均值表明，培训后被试在产出层面都有提升。值得注

意的是, T3-T3 声调组合在感知和产出层面前后测准确率 and 得分均小于其他组合, 反映了泰国被试在三声组合的感知和产出层面面临困难。这也表明, 虽然以往研究证明实验室声调培训方法对母语为非声调学习者有帮助, 但由于其培训时间短、固定地点实验室参加培训和只从感知层面入手, 培训效果没有达到最理想的状态。但随着技术的发展, 设计出一款能兼顾灵活性, 感知和产出相结合的软件是必要的。

3.2.2 感知与产出的关系分析

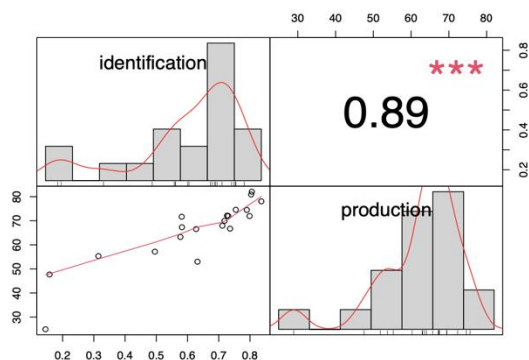


图 6. 双音节前测感知产出相关性

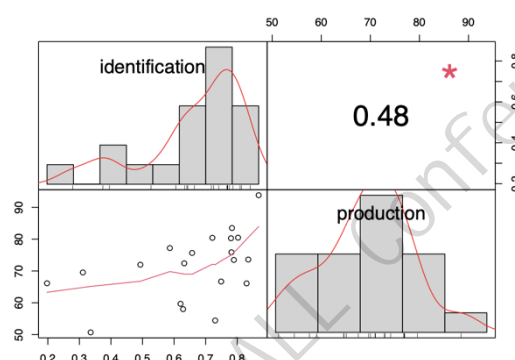


图 7. 双音节后测感知产出相关性

表 3. 16 组声调组合前测感知和产出相关性结果

Tone group	R value	P-value
T1-T1	0.494	0.037
T1-T2	0.293	0.210
T1-T3	0.480	0.032
T1-T4	0.383	0.096
T2-T1	0.597	0.007
T2-T2	0.329	0.156
T2-T3	0.528	0.029
T2-T4	0.711	0.000
T3-T1	0.774	0.000
T3-T2	0.582	0.007
T3-T3	0.556	0.016
T3-T4	0.599	0.005
T4-T1	0.686	0.001
T4-T2	0.491	0.028
T4-T3	0.680	0.001
T4-T4	0.693	0.001

表 4. 16 组声调后测感知和产出相关性结果

Tone group	R value	P-value
T1-T1	0.396	0.104
T1-T2	0.300	0.198
T1-T3	0.243	0.301
T1-T4	0.283	0.226
T2-T1	0.492	0.032

T2-T2	0.123	0.606
T2-T3	0.276	0.284
T2-T4	0.479	0.032
T3-T1	0.511	0.021
T3-T2	0.408	0.074
T3-T3	0.456	0.057
T3-T4	0.386	0.092
T4-T1	0.436	0.055
T4-T2	0.326	0.161
T4-T3	0.395	0.085
T4-T4	0.255	0.277

以上结果表明，泰国汉语初学者在培训前，其感知和产出存在很强的正相关， $r>0.8$ ， $p<0.01$ 。从每一组的关系来看，除 T1-T2, T1-T4, T2-T2 组合之外，其他组合的 p 值均小于 0.05，这表明大部分组合下，其感知和产出存在关系，而在这些组合中，T2-T1, T2-T3, T2-T4, T3-T1, T3-T2, T3-T3, T3-T4, T4-T1, T4-T3, T4-T4 组合的 r 值大于 0.5，证明这些组合的感知和产出至少存在中度相关。在培训后其整体的感知和产出的关系发生变化， $r=0.48$ ， $p<0.05$ ，存在弱正相关。从每一组声调组合的感知和产出相关性来看，培训后，除 T3-T1 组合之外，其他组合的 r 值均小于 0.5，证明泰国汉语初学者培训户的感知和产出相关性弱，有些组合甚至不相关。

这表明，在人为干预之前，即培训前，感知能力弱的同时，产出水平也弱，感知能力强的同时，产出水平也高。但在人为干预后，即培训后，感知和产出的关系发生变化，呈现出弱相关或不相关。

3.2.3 被试错误分析

除探索培训效果以及感知和产出的关系之外，本实验额外分析了被试的发音错误。首先把得分低的典型的错误音频截取出来在 praat 中分析，并且和普通话一级甲等老师的音频，百度汉语 AI 的音频分别对比，找出被试错误发音的具体问题。介于篇幅问题，此处只展示比较典型的几种错误。

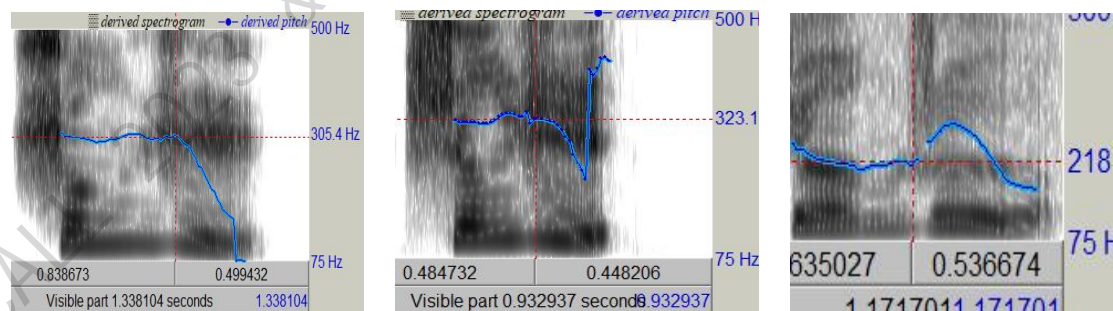


图 8. “生日”的标准，AI 和被试的发音

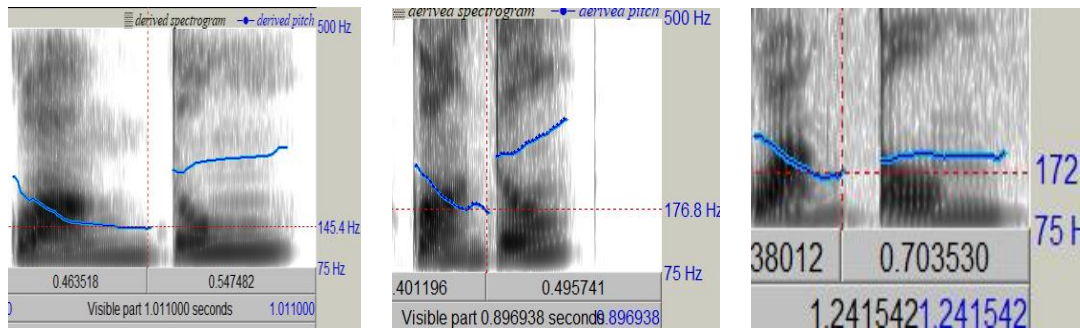


图 9. “广东”的标准，AI 和被试的发音

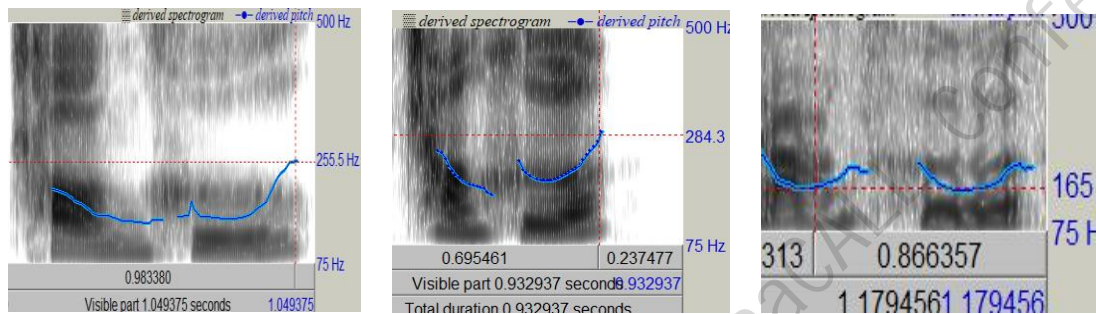


图 10. “场合”的标准，AI 和被试的发音

由以上词汇的标准，AI 和被试的发音声调走势曲线结合音频，可以很准确的识别被试的声调发音错误。例如，图 9 中，生日是 T1-T4 组合，可以很明显看出，被试的一声声域明显低于标准和 AI。图 10 广东是 T1-T3 组合的词，此时存在 3 声变调，被试第二个字的音域低于标准和 AI。图 11 场合是 T3-T2 组合，被试第一个字没有变调，且三声的转折点偏前，导致听起来像二声，整体被母语者识别为“长河”。图 12 可以是 T3-T3 组合，被试第一个字没有变调，第二个字的发音结尾处略低且长。找到具体的错误所在并直接反馈，能让被试清晰知道错误所在并且纠正，使具体问题得到具体分析。

4. 结论和未来研究方向

整体来看，培训在双音节层面的效果微弱，但在产出层面效果显著。在感知和产出的相关性层面，双音节培训前后相关性降低，培训前 $r=0.89$ ，培训后 $r=0.48$ 。出现这一现象主要因为感知在培训后提升微弱，而产出培训后提升效果显著，因此双音节培训后，感知和产出相关性降低。这表明基于计算机的感知培训会影晌声调背景汉语初学者感知和产出的关系，同时也表明，声调背景的汉语初学者在双音节的感知和产出提升并不是同步的。

本实验所应用到的基于计算机的实验室感知培训方法主要从感知入手，并没有加入产出。如被试在呈现音频之后，即刻去模仿。因此感知和产出同时结合的培训效果是否比只涉及感知或只涉及产出的效果更佳有待进一步研究。除此之外，本实验探索了声调背景的汉语初学者，而非声调背景的初学者，如母语为英语，俄语等学习者的感知或产出是否与声调背景的学习者有差异也值得进一步探索，从而找到针对不同母语背景的培训方法，做到差异化培训。

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英语微课获奖作品模态缺失及改进策略探究

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提要 英语语言智能教学受到了学界的日益关注和广泛应用。目前，英语语言智慧教学多集中于慕课、微课等方式。微课教学模式具有短小简便、灵活高效且重点突出的特点。然而，较于传统授课模式，微课存在听觉、视觉、触觉、嗅觉等模态缺失的情况。因此，本文提出通过“物理突显”手段，增加“称呼语”，增加游戏互动，表情管理等策略，以提升学生在学习英语时的效率并改善英语微课教学效果。

关键词 英语微课；模态缺失；改进策略

一 引言

新冠疫情在世界范围内的蔓延对英语教学而言无疑是一次巨大的挑战，挑战的同时也蕴含机遇。疫情期间，我们传统的教学模式无法正常运转。同时，也令我们重新思考，在全球突发公共卫生事件的大背景下，我们应如何更顺利、更高效地开展英语教学活动。

传统的对外汉语教学模式，在信息化的时代已经很难适应海外学生的学习特点和上课方式，与疫情背景下的学习方式产生了巨大冲突。对外汉语教学模式要随着时代的发展不断更新，在调整中适应，在适应中提高。

然而，目前微课教学模式相对于传统授课模式仍存在许多不足。例如，传统课堂中教师能够以合适的距离、顿挫的语调创设温馨幽默的教学环境（姜艳艳、李登桥 2016）。而使用微课的一个普遍现象是：教学质量不高效果不佳，教师操作教学平台不够熟练，学生积极性不高（周朵 2022）。因为在线下的课堂教学中，国际中文教师与留学生在表达与传递信息时，很大程度上要借助贴切的手势、适宜的环境展开教学（姜艳艳、刘宾 2020），这些非语言模态恰恰是微课教学场景中缺失的。

教学设计应结合语法课的课程特点，把握精讲多练、多模态化、情境性、互动性的设计原则，以提高微课的质量。

微课模态的研究聚焦于话语分析、教学设计和教学效果研究。目前，针对课堂教学和微课授课的模态对比还没有被广泛讨论。

为了分析微课相较于传统课堂的模态缺失情况，本文以全国研究生第三届微课大赛获奖作品为研究材料，进行四个方面的探索：

- （1）课堂场景与微课场景的模态有何异同？
- （2）微课教学场景中缺失哪些？
- （3）微课教学场景中缺失的模态在真实课堂中起什么作用？
- （4）在制作微课中有哪些改进策略？

二 课堂场景与微课场景模态对比

模态是指通过一种或多种媒介实现的交流渠道，是一种能够同步实现话语的符号资源（陈新 2020）。人们利用视觉、听觉、触觉、嗅觉和味觉五种方式感知世界，对应产生五种交际模态——视觉模态、听觉模态、触觉模态、嗅觉模态和味觉模态（姜艳艳、刘宾 2020）。

线下授课模式中教师口语、教学音频、视频旁白、课件音效共同构成听觉模态；课件文本、视频字幕、板书文本、教师仪表、手势体态、面容表情、课件效果、视频画面构成视觉模态；师生空间、感知接触二者构成触觉模态；嗅觉模态体现为教师的身体气味。

微课学习模式中听觉模态包含正式口语、音频文件、视频旁白等有声语言，教学课件中的文字内容、教学字幕等无声文字构成视觉模态。

对比微课教学模式与线下授课模式的模态，我们能够发现：相较于课堂场景中的多元模态，微课学习场景中的模态体现出了不同程度上的缺失。通过对比结果我们可以得出，视觉、听

觉模态在微课制作过程中有少部分缺失，而触觉、嗅觉模态则完全缺失。这意味着，学习者无法接触到全面的教师形象，只能依靠视觉和听觉通道获得关于教师的相关信息，学生在微课学习的过程中也很难感知教师的自身魅力和吸引力，教师更是无法获取关于学习者的学习策略和所学成果（李琳 2022）。

三 英语微课制作的模态缺失改进方案

3.1 视觉模态缺失——通过字幕标记强化学生印象

部分视觉模态的缺失会令微课学习效果骤减，学生往日熟悉的板书，教师的手势与表情均无法在微课中出现。为了解决这一问题，我们采用加入字幕标记的方式强化学生印象。

在设计微课时，我们便可以借鉴第二语言习得中选择性注意的认知因素，加强设计。这样能够使学习者大脑快速注意目标信息特点并对其加工处理，让重难点不断在学习者脑海中复现、强化。

微课制作中加强设计的合适方案是字幕标记，体现为加粗字体、加大字号、变色、闪烁、加框、加下划线、指示标识、声效等物理手段（李琳 2022）。需要注意的是，色框和下划线的出现方式应与汉语母语者的认知方式一致，如下划线应以从左向右的方式出现。

4.2 听觉模态缺失——通过增加“称呼语”引发学生注意

教师口头语的缺失会令微课学习的氛围凝重乏味。久而久之，学习者会不由自主地走神，甚至主动放弃学习。为了引起学生注意，我们可以增加适量的“称呼语”。

称呼语是传递信息的媒介语言系统，能够体现言语交际参与者的角色关系，亲密程度及社会地位。称呼语作为口头话语标记，具有极其丰富的社会意义和文化内涵，是社会距离和心理距离在言语行为上的体现。

称呼语能够拉近师生间的距离，缓和师生关系。同时，称呼语具有提示作用，可集中学生注意力并提示学生接下来需要完成相应任务。

4.3 嗅觉模态缺失——通过游戏互动激发学生热情

微课制作中，我们可以利用现代教育技术设计一些游戏环节有效代替触觉模态。

传统模式下的触觉模态主要体现在组内互动、小组讨论中。因为微课特有的教学模式，导致学生无法充分面对面讨论，导致学习氛围沉闷无聊。但是学生们通过游戏能够活跃学习氛围、营造相对轻松的授课环境，也可以积极调动思维，提升产出语句的能力（沈晓梅 2018）。

利用微课教学场景进行英语教学时，教师要扬长避短。我们既要利用微课灵活多趣的特点，也要避免机械死板的实录。我们要把一节微课设计成系统的、动态的语言点，让学生在愉快高效的环境下，快速掌握知识，提高交际能力。

4.4 触觉模态缺失——通过表情管理拉近学生距离

表情是利用面容、眼神传递情绪及非言语信息的交际信号（张冰冰 2022）。留学生在真实课堂场景中已经对教师的表情信号十分熟知甚至敏感，教师在开展教学活动时的积极表情会促进留学生的学习效果，提升留学生互动的质量。

微课制作时，教师可以利用积极表情增进师生感情，提高教学质量。这样，留学生会逐渐适应并愿意运用微课手段学习汉语，英语教学智慧化也会逐渐成熟。

五 结语

微课是时间短暂的新兴授课模式，可以将零散呈碎片形式的知识点系统地呈现出来。微课教学场景中模态缺失使教学效果大打折扣，这就需要教师在制作过程中采用其他教学手段弥补。本文对比了课堂教学和微课教学的模态，分析了微课模态缺失情况并对此提出改进策略。

微课教学场景中视觉、听觉模态在微课制作过程中有少部分缺失，而触觉、嗅觉、感觉模态则完全缺失。缺失模态在真实课堂中往往具有集中学生注意、拉近师生关系、增进学习效率的作用。这些模态缺失会影响学生学习效果。

针对上述问题，本文提出通过字幕标记强化学生印象，通过增加“称呼语”引发学生注意，

通过课堂练习激发学生热情, 通过表情管理拉近学生距离四项解决策略。

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高中英语线上作业设计有效性探究

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摘要: 随着教育模式的不断升级,越来越多的学科采用线上线下双向的教育教学模式,这也为作业开辟了新的方式。高中英语教师应顺应新时代教育教学的发展趋势,积极响应高中英语教学改革的要求,通过设计有特色、有针对性的综合性作业,使线上作业有效高效;设置多样化、多形式的网上作业,从听说、读写、视听等角度出发,提高作业的趣味性和创新性,加强作业的针对性;使学生能够全方位、多角度地探索新时代的教学内容,从而促进英语教学效率的提高。

关键词: 线上作业; 高中英语; 有效性

一、前言

素质教育的不断改革,使教育理念逐渐开始向社会人才培养靠拢,更加注重学生的综合素质和品格。高中英语教学不再只是对学生笔试能力的考查,而是更加注重学生阅读习惯和语言能力的培养,对学生个人品格、实际应用能力和创新思维的培养也有了更加深入的研究。随着教育模式的不断升级,线上教学已成为学校教育中不可或缺的一部分,英语作业设计也应随着教育模式的升级而不断改善。在此情况下,英语教师在设计作业时,应考虑到学生思维的发展和学习习惯的培养,采用有效的线上作业设计来提高教学效果。因此,对于高中英语线上作业有效性的研究势在必行。

二、当前高中英语线上作业设计现状

在传统的作业设计中,教师通常会使用大量的英语练习来帮助学生巩固课堂知识。这样的教学方式虽然可以在一定程度上加深学生对英语知识的记忆,但也容易让学生产生厌倦。在“双减”政策背景下,通过减轻学生作业负担,实现作业设计多样化,可以更有效地解决这个问题。教师可以通过多元化的作业设计帮助学生巩固知识。然而,在设计线上作业时,大多数教师更注重单词的拼写和运用,忽略了听力、口语、思维能力等方面的训练。如此枯燥的作业形式和内容,不仅会影响学生完成作业的积极性,也会让学生的创造力毫无体现。学生也没有真正巩固所学,没有去独立思考,复习所学知识,所以作业效果不强。同时,很多英语老师在布置作业时都是盲目的,目的不明确。布置的作业可能无法巩固本课程的内容,或者与下一堂课的内容无关。线上教学中,学生的作业提交率本就日益下降,如果是毫无目的的作业,学生就更不愿意完成。再者,作业设计没有针对性,层次不明确。由于高中生的学习能力存在差异,他们对知识的理解和接受程度也不同。许多作业设计没有考虑到学生英语水平的分层,只为全班设计一份作业。同样的作业,对于基础良好的学生来说太容易,让他们感觉毫无挑战,而对于基础薄弱的学生来说却很难完成。可见,很多传统的作业设计和布置本身就有很大的局限性,面对线上教学,这类作业并没有很大的帮助。因此,针对高中线上英语教学的现状,英语教师必须探索不同于线下的作业设计。只有充分发挥线上教学的优势,才能更好地辅助学校教学。

三、促进高中英语线上作业设计有效性的策略

(一) 提高作业设计的多样性与趣味性

线上教学的最大优势是广泛的网络资源。要实现作业设计的趣味性和多样性,就要布置有特色的作业,兼顾学生的好奇心和学习主动性,努力提高他们的学习兴趣,增强他们的学

习主动性,从而激发他们内在的学习动力,促使他们更加自主、积极地参与学习,从而达到轻松愉快地掌握知识的目的。设计配音、跟读句子等形式的作业,可以同时锻炼学生的听、说、读能力,使学生获得综合性发展。例如,教师可以为学生布置英语戏剧作业类型,帮助学生通过“视觉、听觉、触觉”等多种感官在英语学习中发挥创造力。设计搜集类作业,让学生通过不断体验信息收集、信息分析和信息整理活动,逐步形成信息能力。例如,通过让学生收集中西文化、热点新闻等内容,丰富知识储备,从而构建对文化遗产和文化遗产保护的初步认知,为课堂上与老师或其他学生的交流做好准备。设计探索类作业。探究式学习是新时期高中生学习的主要方式。传统的英语作业由于缺乏探究性,很难引起学生的兴趣。因此,探究作业是英语作业中不可缺少的一部分。以 **Natural disasters** 为例,教师可以要求学生在课后继续在网上收集与地震相关信息。比如收集地震成因、地震与人类活动的关系等问题,从而对地震进行更深入的探索,既能自然地锻炼自己的探索能力,又能将所学内容与现实生活相结合,建立对人地关系的认知,便于形成人与自然的和谐观。

(二) 提高作业设计的生活性与实践性

英语是一门语言学科。在“双减”政策的指导下,教师要在作业设计过程中进一步突出英语的语言和交际特色,帮助学生感受英语学科知识与现实生活的关联,引导学生体验生活,带动学生实践。通过实践活动,提高学生对英语单元学习主题的理解,进一步增强对知识的认知。在语言能力锻炼的同时,可以提高学生的思维品质、文化品格等素质,从而强化教育效果,实现全面发展。以 **Food and Culture** 为例。在学习了该单元的内容后,大多数学生都储备了有关单元主题的语言知识,他们可以用这些语言知识来描述饮食文化。基于此,教师可以在课后布置与单元主题相关的实践作业:学生根据自己的实际情况选择自己喜欢的传统食物,通过录制视频讲述美食故事、展示饮食文化,并将视频上传到线上教学平台。在完成这项作业的过程中,学生可以在互联网上收集有关传统食物的信息,自由表达自己的想法和感受。他们不仅可以运用和巩固在课堂上学到的知识,还可以锻炼信息收集和语言表达的能力。将视频上传到线上教学平台后,学生不仅可以反复观看自己的视频以找出自己的不足,还可以观看同学上传的视频以了解其他学生的优点。在观看和了解其他学生精彩的课外生活的同时,学生可以储备英语知识,夯实英语学习和运用基础。

(三) 根据学生层次进行分层设计

在新的课程教育环境下,教师需要正确认识学生之间的个体差异。他们需要知道每个学生都是一个独立的个体。在学习英语的过程中,每个学生都有自己的特色。教育应遵循学生的个体差异,因材施教。因此,教师在设计作业时,应针对不同学习条件的学生进行作业的分层设计。对于不同层次的学生,教师应提供不同类型的作业。例如,强调基础知识和技能训练的作业、强调扩展和延伸并注重知识运用的作业、强调灵活运用知识并引导学生以创造性思维解决问题的作业。对于英语水平较差的学生,教师应加强对此类学生的基础训练,重点布置基础作业;对于英语水平较高的学生,教师可以使用扩展和实践的问题来关注作业的内容,从而培养课堂上各类学生的思维水平和实践能力。例如,在学习《**Scientists who changed the world**》一课时,教师可以给 A 类基础较薄弱的学生布置跟读作业——让学生跟随音频流利地阅读文章;给 B 类中等水平的学生布置翻译作业——让学生利用网络资源完整地翻译文章;给 C 类基础较好的学生布置探究作业——让学生自行在网上搜集更多的获得诺贝尔奖的科学家的名字以及与他们相关的故事,他们可以通过阅读相关的英语文献资料来完成作业,并且在课堂上与大家分享他们最后的成果。根据学生的具体情况,在学生的能力范围内给不同的学生布置不同的作业,让学生完成即符合自己的能力水平但是又具有挑战性的作业,使学生在完成作业的过程中能够巩固知识,锻炼能力,从而获得成就感。

(四) 完善作业评价机制

作业评价是教学活动的过程。它是指教师在学生完成作业后对作业进行检查、纠正

和点评等。作业的评价是学生对知识的进一步消化，所以这一步的重要性不容忽视。合理、科学的作业评价，能给学生信心，让他们肯定自己的努力，同时也是学生对教师教学的信息反馈。因此，教师在进行作业评价时，首先要做的是及时评价。与线下教学不同，大多数学生不愿意在课堂上表达自己的想法，而在线上课堂，学生会更愿意提问。老师可以随时回答学生的问题，也能将学生的作业反馈给学生。缩短学生等待反馈的时间，可以使学生在更短的时间内掌握知识，提高语言运用能力。其次，教师要进行多元化的评价。例如，教师可以让学生将作业上传到线上平台，学生和教师都可以进行批改。这样就可以做到教师对学生的评价，学生互相之间的评价，学生自己对自己的评价。不同的评价方式可以帮助学生从不同方面认识自己的问题，找到更多解决问题的方法，加深对问题的印象，从中吸取教训，避免再次犯同样的错误。最后，教师要做人性化的评价。教师在进行作业评价时以鼓励与引导为主，以激发学生的学习动机。在评价方式上，教师要做多元化评价，不能单凭分数来评判学生。课程评价必须以形成性评价和总结性评价为基础，除此之外还要强调评价主体的多样性、评价形式的多样性、评价内涵的全面性和多维度的评价目标。

四、总结

后疫情时期的“互联网+教育”势不可挡，改革作业是教师必须完成的任务。线上教学已经经历了近四年的探索，其中作业在巩固线上教学成果的价值毋庸置疑。对于当今的高中生来说，课余时间基本上都被作业占据了，所以有效的作业设计对于现阶段高中英语的线上教学尤为重要。在线上教学过程中，教师要突破传统作业的固化体系，呈现丰富多彩的作业设计，依托线上教学平台，将线上作业的新模式应用到各个教学阶段，让学生不仅能有效掌握英语知识，还能通过完成不同的作业来锻炼自己的英语学习能力，促进英语学习的发展。

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Research on the Effectiveness of High School English Online Homework

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Abstract: With the continuous upgrading of education mode, more and more subjects adopt the two-way education and teaching mode of online and offline, so it also opens up new ways of homework. Senior high school English teachers should conform to the development trend of education and teaching in the new era, actively respond to the requirements of senior high school English teaching reform, and make online homework assignment effective and efficient by designing unique and targeted comprehensive homework; set up diversified and multi-form online

homework, starting from listening and speaking, reading and writing, audio-visual and other perspectives, to improve the interest and innovation of homework, strengthen the pertinence of homework; to enable students to explore the teaching content of the new era in an all-round and multi-angle way, thus promote the improvement of English teaching efficiency.

Key words: Online homework; High school English; Effectiveness

GLOCAL 2023 & 2023 19th ChinaCALL Conference

基于融合理念的“育人+智慧+实践”中华农业文化英译课程教学模 式探索

张晓容
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摘要:

新时代外语教育呈现出工具性、人文性、兼具科学性的新态势;信息时代促生了翻译智慧教学新生态;教学活动由“教”向“学”的转变,注重学以致用、知行合一,深化学生的“家国情怀”和“人文素养”。在全面推进乡村振兴的背景下,农林高校的翻译教学应紧跟时代脉搏,本研究基于融合教育理念,旨在构建农林特色的“育人+智慧+实践”的教学新生态,助力培养知农爱农情怀、强农兴农使命的翻译人才,更好的服务乡村振兴。

关键词: 融合理念, “育人+智慧+实践”, 中华农业文化英译, 翻译教学模式

引言

中国农业文化是我国传统文化最核心的组成部分,是中国文化的精华所在。农业文化是中华文明立足传承之根基,是中国优秀传统文化的主干成分,也是构建中华民族核心价值观的重要精神文化根源。中国农业文化遗产不仅是中华民族在长期耕作中积累的物质文化、精神文化和方式文化的汇总,更是人类珍贵的文化遗产。担负着“用英语讲好中国故事、传播好中国声音”这一伟大使命的当代大学生需要了解中国传统农业文化的相关知识、熟知如何用英语表达以及掌握文化阐释的能力。农林高校的大学生更应了解有关中国农业文化的英语表达以及中国特色农业文化的翻译方法与策略。加强对我国农业文化的认同感,培养“一懂两爱”的新时代农业人才,更好以翻译为桥梁,将中国农业文化传播出去,增强我国文化软实力。

1. 农业文化外译课程

党的二十大报告强调,中华优秀传统文化源远流长、博大精深,是中华文明的智慧结晶。农耕文化,是中华优秀传统文化的重要组成部分,是乡村全面振兴的持续精神力量,更是加快建设农业强国的底气所在和自信之源。

农业文化是中华优秀传统文化的重要组成部分,承载着中华文明生生不息的精神密码,镌刻着中华民族天人合一的思想智慧。《中华农业文化外译》课程依托中国农业文化中最具国际影响力、最典型、最核心的农耕文化思想或想象,围绕农业起源、农作物及农具、农学思想、农业典籍、民俗等主题,提出相关翻译原则和翻译策略,结合大量译例分析说明具体的翻译方法和技巧,加上学生对相关农业文化的理解和领悟。

2. 基于“融合”理念的中华农业文化外译教学

融合式教学是在我国教育改革理想与学校现实之间的张力不断加剧的背景下提出来的。融合教学理念是顺应时代发展,科学合理的大学英语教学理念,在实际的教学过程中,大学英语的教学目标、内容、特性、途径、工具和方式等各方面都应是多元融合的。

基于融合理念的“育人+智慧+实践”大学英语教学实施人才培养理念和路径,满足新时代发展的新需要,是新时代外语教学的必然要求。《中华农业文化外译》课程融合语言教学,跨文化交际与农林特色,教学过程中秉承融合教育理念,实施“育人+智慧+实践”的农林特色培养路径。

3. 育人+智慧+实践的 ESP 融合式中华农业文化外译教学实践

3.1 育人-课程思政

(1) 从文化与翻译视角厚植理想信念

中华农业文化外译教学目标是培养中华农业文化的有效传播者，要基于农林院校专业特色，始终把价值引领与知识传授、能力培养融为一体，坚持把“立德树人、铸魂育人、以文化人、融通中外、语达天下”作为育人导向与价值旨归，致力教育引导学生“厚植家国情怀，传承中华文化；坚持胸怀天下，推进文明互鉴”。课程思政设计既要达到“春风化雨”、“潜移默化”的效果，又要有“惊涛拍岸”的心灵共鸣，激发学生对中华文明成果的认同。要努力加强翻译专业学生的家国情怀教育、人类命运共同体的教育，让学生真正做到“世界观”与“中国心”的兼具。

(2) 从译者翻译立场构建农业文化对外传播体系

中国传统文化就是农业文化，农耕文明是历史上出现的第一种文明，农耕定居的活动和生产工具的发展是人类社会逐渐走向文明的开端，是人类摆脱纯粹的依赖自然，走向以自己的意愿生存的起点。农耕活动受到天气和自然的影响和制约，往往有顺应自然的特点。农耕文明还有自给自足的特点，中国历史上传统的男耕女织的小农经济就是很好的体现。农耕文明的定居生活才能创造出一个稳定的环境，积累物质和精神财富，这是一个民族生生不息、日益壮大的基本条件，与此同时孕育了灿烂的文化，有利于文明的传承。在教学过程中要从农业文化信仰、农业文化思想、农业文化仪式、农业文化符号、农业文化产品五大文化维度理解中国农业文化。

(3) 从翻译策略阐释传承中华优秀农业思想

中国文化的外译工作，不仅关系到对外交流与合作，而且关系到国家软实力建设与国家对外形象提升。农业文化遗产沉淀着中华文化和中华民族最深沉的精神追求，包含着中华民族最根本的精神基因，是中华民族独特的精神标识。农业文化蕴含着丰富的哲学、经济、文化、生态等多元价值，是中华民族文化自信的重要组成部分。

“天人合一”——如在哲学方面，建立在尊重和顺应自然基础之上的“天人合一”精神思想尤为突出。“天人合一”提倡严格遵守人与自然协同并进的原则，运用自身思想智慧与辛勤劳作，进行种子的播种、土地的耕耘和粮食的收获。这种思想正与当今倡导的可持续发展、绿色环保的理念相通，对于展开绿色行动和进行环境保护有着重要的思想指导意义。

“天时地利人和”——中国古代农书翻译是农业文化外译的重要内容，四大农书之一的《农政全书》中说到，教人务农必先教人务农的本，即教人懂得农业是国家的根本。引用了《管子》中“仓禀实而知礼节，衣食足而知荣辱”等语句，由农本引申到农业与礼仪、价值观形成的重要联系，即“农本”与“人本”的关联。

3.2 智慧教学

(1) 运用语料库开展翻译教学

耕读文化传播实践研究——基于中英双语语料库，农业文化术语中英双语语料库建设，

例如，在介绍粮食作物种类黍、稷、粱、秫、麦、稻、秫稻时，石声汉的译法如下：

黍 Shu (glutinous paniced millet)

稷 Chi (glutinous paniced millet)

粱 Liang (ordinary Setaria)

秫 Shu (glutinous Setaria)

麦 Mai (wheat)

稻 Tao (rice)

秫稻 Shuh-tao (glutinous rice)

这里石声汉的译文既保留了原文化信息，又通过文化替代法很好地照顾到了读者。由于认知差异，对同一个或同一类事物，有的语言分得很细，用几个不同的词来表达；有的语言则分得较粗，只用一个或较少的词。例如，汉语的“稻”、“米”、“饭”是分得很清楚的，农作物叫“稻”，农作物的籽实叫“米”，煮熟了的叫“饭”。在英语中，却并不对这三者进行区分，而是统一称之为 rice。在文学典籍的翻译中，

不对这些词作区分并不会造成太大影响。

五谷，以北京大学 CCL 语料库为汉语语料库，汉语语料对原语词汇的文化内涵阐述，帮助理解中国文化外译语言的文化内涵，搜索结果有 500 条，“五谷、五果、五畜、五菜”通过例句和上下文，学生可以更好的理解“五谷”的文化内涵，常见搭配，运用文体和场合；以 CNKI 翻译助手为双语对照语料库，帮助筛选可供使用的译语表达。CNKI 翻译助手作为国内最全面的中英双语对照的语料库，提供的译语表达具有权威的参照性。在 CNKI 翻译助手检索到的“五谷”双语文献有 22 条，其中 20 条将五谷翻译成 five cereals，其余两条分别翻译成 five cereals (rice, barley, wheat, soybean and azuki bean)，five cereals (barley, wheat, rye, triticale and oat)

为了验证“五谷”的英译是否能被目标读者接收，选用美国当代语料库 COCA (Corpus of Contemporary American English) 对译文进行验证，将 five cereals 输入译入语语境进行验证，检索结果为 2，分别是：

The screenshot shows the top navigation bar of the Corpus of Contemporary American English (COCA) interface. It includes a search bar, a frequency tab, a context tab, and a 'CONTEXT +' button. The interface is in English and features a blue header with various icons for search, download, and help.

Source information:

Source	MAG: Good Housekeeping
Date	2007 (Jan)
Publication information	Vol. 244, Iss. 1; pg. 131, 3 pgs
Title	15 foods to help you lose
Author	Denise Foley

Expanded context

to be slimmer than those who don't. A study from Purdue University found that when a group of 15 normalweight people added about 500 calories worth of peanuts to their regular diet, they consumed less at subsequent meals. The participants also revved up their resting metabolism by 11 percent, which means they burned more calories even when relaxing. Health bODUS: Walnuts contain omega-3 fatty acids. And researchers at Loma Linda University recently found that eating 10 to 20 whole pecans daily can reduce heart disease risks. 14. HIGH-FIBER CEREAL studies show that you can curb your appetite by eating a bowl for breakfast. But how well does it really work? Researchers at the VA Medical Center and the University of Minnesota in Minneapolis tested the theory against the ultimate diet challenge: the buffet table. They gave 14 volunteers one of five cereals before sending them out to the smorgasbord. Those who'd had the highest-fiber cereal ate less than those who didn't have as much fiber in the morning. Try General Mills Fiber One (14 grams per serving) or Kellogg's All Bran With Extra Fiber (13 grams per serving). 15. HOT RED PEPPER Eating a bowl of spicy chili regularly can help you lose weight. In a Japanese study, 13 women who ate breakfast foods with red pepper (think southwestern omelet) ate less than they normally did at lunch. The magic ingredient may be capsaicin, which helps suppress appetite. Sidebar To get real weight-loss results, go grocery shopping // #

This is another screenshot of the COCA interface, showing the same search results for 'five cereals'. It displays the navigation bar with the 'CONTEXT +' button highlighted, indicating the expanded context view.

Source information:

Source	MAG: Total Health
Date	2004 (Dec)
Publication information	Vol. 26, Iss. 6; pg. 20, 3 pgs
Title	Can Memory Loss Be Prevented?
Author	Dharma Singh Khalsa

Expanded context

detail how to reduce stress through the regular use of the relaxation response and meditation. Other books only mention that in passing. Moreover, The Better Memory Kit is the only kit that really has up-to-date information on which vitamins to take for which specific memory loss conditions. For instance, the information differs for someone who wants to prevent Alzheimer's, versus someone who has early Alzheimer's, versus someone who simply wishes to improve brain function. The Better Memory Kit is available at bookstores or call 800.654.5126. Sidebar Try to think about ways you can incorporate these activities in your daily life. For instance, you could combine a "brain aerobics" workout with your grocery shopping by memorizing your shopping lists and shop by memory. For a specific exercise, you could go down the cereal aisle and memorize the first five cereals. Come back 10 minutes later and see if you have remembered them correctly. If you consider incorporating meditation, good nutrition and exercise to be drastic changes to your current lifestyle, try making small trade-offs instead. For instance, you could trade 30 minutes of TV for 30 minutes of working on a crossword puzzle. You could trade one of your steak and potato dinners for a big salad with leafy, green vegetables. Instead of starting your morning with a pot of coffee, try a 20-minute "Wake Up To Wellness" meditation. Trade in an afternoon at the movies for a game of tennis with friends. Work on incorporating more and more amounts of healthy, memory-building activities and nutrition into your daily life, and you'll be well on your way to living a better memory lifestyle. The Ten Warning Signs of Memory Loss * Forgetting things more often * Putting

说明“五谷”的译文“five cereals”可以被目标语读者接受。

再以农耕文化为例，CNKI 翻译助手检索到的译词中“farming culture”出现频率最高（265 次），在 COCA 中 farming culture 出现了 13 次，对两条最近文献（2018 年，2015 年）译入语语境的分析来看，译语 farming culture 基本达到了源语与目标语形式与内容的对等。

农耕文化 共为您找到 25 个翻译词条, 显示全部译词

farming culture (265)	cultivation culture (16)	agriculture culture (14)	agricultural civilization (6)
agro-farming culture (4)	agricultural cultural heritage (3)	farming civilization (3)	agricultural culture (3)

Corpus of Contemporary American English

SEARCH FREQUENCY **CONTEXT** CONTEXT +

(SHUFFLE)

CLICK FOR MORE CONTEXT HELP SAVE TRANSLATE ANALYZE

1	2018	ACAD	American Indian Quarterly	associated with farm abandonment on the NNSJRS, the loss of traditional crops and Navajo farming culture is incalculable. # Beyond the Shiprock Chapter
2	2015	MAG	ScienceNews	14838 Section: NewsHUMANS & SOCIETY # Mass grave fuels debate over demise of early farming culture # Central Europe's first farmers cultivated not jus
3	2013	MAG	America	earlier decades), Khrushchev was able to coax real productivity out of the Soviet farming culture . # " It was my father's destiny to serve the Russian people
4	2013	MAG	ScienceNews	boom around 7,500 years ago marked the start and spread of Europe's earliest known farming culture , recognized by its distinctive lined pottery. A second
5	2012	WEB	wikihow.com	amount of land. # In areas that were recently rural or have a strong farming culture , no law or license may be required to keep chickens. # If
6	2006	SPOK	NPR_ATCW	time. (Soundbite-of-flow) DOUG-FINE-reportin: Flowing acequia water is at the corps of the traditional farming culture and economy in Southwest New Me
7	2006	ACAD	Archaeology	last year. Pottery found at the site shows the characteristic stroke decoration of Neolithic farming culture in Central Europe. # By Ulrich Boser # # ULRICH E
8	2003	MAG	NaturalHist	and when that inadvertent feeding on the part of ancestral lower termites developed into Macrotermes farming culture has remained unanswered. The Ec
9	2003	ACAD	GeographRev	, those that are adjacent to the mountain West. Bountiful foods associated with the farming culture of the Midwest were found in eastern parts of the Dako
10	2002	MAG	Futurist	. Unlike the hunter-gatherer culture that had little effect on the earth, this new farming culture literally transformed the surface of the earth. The Industrial
11	1998	MOV	Mysteries of Egypt	of Egypt from lands upstream where wildlife flourished. Rich land made possible a vast farming culture and a stable civilization able to turn from daily surv
12	1995	MAG	SatEvenPost	ancestors, together with their co-immigrants, constituted only a frail transplant of the great farming culture of the Ukraine. Nevertheless, they brought enc
13	1990	ACAD	Raritan	my father. With some misgivings, I agreed. Perhaps I feared that the farming culture and tobacco-rituals as I had recounted them would not sufficiently agr

Corpus of Contemporary American English

SEARCH FREQUENCY **CONTEXT** CONTEXT +

Source information:

Source	ACAD: American Indian Quarterly
Date	2018
Title	Feeding the Tribe: The Role of Soft Infrastructure in Addressing the Root Problems of the Navajo Nation San Juan River Irrigation System
Author	Prairie dogs

Expanded context

as well as dairy and floral production, are grown using water from EBID. According to the 2012 US Census of Agriculture, the market value of all crop production in that county was a little less than \$167 million from 76,172 harvested acres, which amounts to \$2,190.48/acre. If similar per acre gross returns on the NNSJRS were achieved, the gross income would be about \$26.6 million annually. Raymond in southern New Mexico has a much longer growing season than does San Juan County, so \$26.6 million can be considered the very high upper end of what might be possible on the NNSJRS.52 Maximizing income from farming in an irrigation system and maximizing acreage in production, however, do not always lead to the same cropping patterns.53 In addition to the economic opportunity costs associated with farm abandonment on the NNSJRS, the loss of traditional crops and Navajo **farming culture** is incalculable. # Beyond the Shiprock Chapter, located in the northwest corner of San Juan County, New Mexico, is a section of irrigable farmland called Area 7 that contains an estimated 2,200 acres that were once farmed back in the 1970s. This farmland could be reopened to production to help increase the number of acres to the 12,165 maximum acres of farmland that can be irrigated. The portion of LUP farm plots that is under structures needs to be estimated to help determine how much of the current LUPs could actually be farmed, which will help determine how much of Area 7 could be opened up for farming. # The issue of whether there are enough Diné farmers to farm all of the possible acres may be a consideration whether to spend money to improve the irrigation system. However, while no systematic survey of potential new farmers has been conducted, the economic, cultural

Source information:

Source	MAG: Science News
Date	2015
Publication information	9/19/2015, Vol. 188 Issue 6, p8-8. 1/2p. 1 Color Photograph.
Title	Bones tell of 7,000-year-old massacre
Author	BOWER, BRUCE;

Expanded context

14838 Section: NewsHUMANS & SOCIETY # Mass grave fuels debate over demise of early farming culture # Central Europe's first farmers cultivated not just crops but also massacres, with some villages nearly wiping out neighboring settlements, researchers say. # Evidence of this ancient warfare appears on human bones found scattered in a ditch exposed by German road workers in 2006, says a team led by anthropologist Christian Meyer of the University of Mainz in Germany. These bones represent at least 26 people who were beaten to death and possibly shot with arrows before being dumped in the ditch, the team reports online August 17 in the Proceedings of the National Academy of Sciences. The mass grave lies near remnants of an ancient farming site called Schneck-Kiliansteden. # A majority of recovered skull pieces display cracks and depressions probably caused by blows from stone tools attached to handles. Two bone arrowheads also lay among the remains. Fractures on many lower leg bones indicate that attackers immobilized and perhaps tortured victims before

天人合一、天时地利、三才、《齐民要术》、渔樵耕读、耕读传家、精耕细作、自给自足、农具等这些表现农业文化信仰、农业文化思想、农业文化仪式、农业文化符号、农业文化产品的农中国特色农业文化，要采用意译法、音译加注等。

(2) 译后编辑案例分析教学

进入旧石器时代晚期，遗址数量增多，文化遗物更加丰富，技术有明显进步，文化类型也更加多样。在华北、华南及其他地区，都存在时代相近但技术传统不同的文化类型。总的来说，这一时期文化的主要特点是，除少数地点外，石叶工艺和骨角器生产不很发达。

The late Paleolithic period witnessed the increase in the number of sites with increasingly abundant cultural relics, significant progress in

technology, and more diverse cultural types. Similar cultural types with different technological traditions existed in north China, south China and other regions. In general, cultures of this period is mainly characterized by the fact that, except in a few locations, stone leaf craft and bone horn ware production are not well developed.

三、新石器时期的农业 Agriculture in the Neolithic Period

中国的新石器时代是原始社会从氏族公社制向阶级制过渡的一个历史阶段。它

园苑
句式调整

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改: Overall, the main characteristic of this period was that stone leaf craft and bone, antler and ware production were underdeveloped, except in a few sites.

该文化最早在 1973 年被发现，在 1973—1974 年和 1977—1978 年两次对河姆渡遗址作发掘并有资料。黑陶是河姆渡陶器的一大特色。在建筑方面，遗址中发现大量干栏式建筑的遗迹，在食物方面，植物遗存有水稻的大量发现，被断定是人工栽培的水稻，此外植物残存尚有葫芦、橡子、菱角、枣子等。动物方面有羊、鹿、猴子、虎、熊等以及猪、狗、水牛等家养的牲畜。河姆渡文化的骨器制作比较进步，有**耜**、鱼镖、镞、哨。

First discovered in 1973, the hemudu site was excavated twice and documented respectively in 1973-1974 and 1977-1978. Black pottery was a major feature of Hemudu. In architecture, a large number of stilt style architectures were found at the site. In terms of food, a huge number of rice were found, which was identified as artificially cultivated. In addition, there were gourds, acorns, water chestnut, jujube and other plants. Animals included sheep, deer, monkeys, tigers, bears and pigs, dogs, buffalo and other domestic livestock. The bone implements of Hemudu culture is relatively advanced, including **Si(plowshare)(a spade-shaped farm tool used in ancient china), fish darts, arrowheads and whistles.**



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可以详细引申

small mouthed peaked bottom bottle, etc. The painted pottery displayed an ingenious technique. **With black lines decorated on the red color, the patterns of those pottery exuded simplicity and naturalness, including human faces, fish, deer, plant branches, leaves and geometric patterns.**
(有道翻译 Colorful pottery is very color, red ground black color, simple and simple pattern, draw human face, fish, deer, plant branches and leaves and geometric patterns.)

距今 6 000 多年前，渭河的支流河水平，有一座古老的氏族部落——半坡。这里东依**白鹿**终南山，可常年进山打猎；北边是开阔的平原地带，适合于发展农业；河之水流经这里，为半坡人提供了大量的水产资源，也是一个绝佳的捕鱼场



无全
彩陶十分出色，红地黑彩，花纹简练朴素，绘人面、鱼、鹿、植物枝叶及几何形纹样。



无全
句子结构和措辞需调整



3.3 实践教学

(1) 建设“农耕文化语料库双语平行语料库”

No	Chinese S	English
1	齐民要术	The Book of Ch'i Min Yao Shu
2	太守	T'ai Shou, governor, literally "Warden Major"
3	贾思勰	Chia Ssu-hsiel
4	今采摭经传，爰及歌谣；询之老成，验之行事；直自耕农，终于醯醢。	"(So I) have made excerpts from classics, contemporary books, proverbs and folksongs, gathered informations from experts, and drawn from personal experience.
5	资生之业，靡不毕书，号曰《齐民要术》。	Beginning with ploughing and cultivation, down to the making of vinegar and meat-pastes, any art useful in supporting the daily life (of the common folk) is jotted down. The book is (thus) named Ch'i Min Yao Shu (Essential Ways for Living of the Common People).
6	凡九十二篇，分为十卷，卷首皆有目录，鄙意晓示家童，未敢闻之有识。故叮咛周至，不尚浮辞。览者无或唯鹑。……舍本逐末，贤者所非。	The 92 Chapters are divided into 10 scrolls (volumes or fascicules). Sagacious man never will abandon the basic occupation and chase after the frivolous; mending long straits with sudden profit usually brings in hunger and cold.
7	日富岁贫，饥寒只渐，故商贾之事，而不录。	Therefore no account is given for commercial dealings.
8	花草之流，可以悦目，徒有春花，而无秋实，匹诸浮伪，盖不足存。"	Flowers may certainly be pleasant for the eye, but (empty) blooms in spring without substantial autumn fruits are vain and fraudulent things. So there is no need to record them."
9	天时地利	realisation of the importance of proper choice of season and soil
10	上土，中土，下土	Best, medium and least suitable ground for sowing various crops
11	耕田	reclamation of land
12	收种	seed-corn
13	收谷	spiked millets
14	黍稷	panicked millets
15	梁稊	setaria
16	大豆	larger-grained beans, soya
17	小豆	smaller-grained lesser beans
18	种麻	hemp
19	种麻子	seed-hemp
20	大小麦	barlev and wheat

实如栝桐，蒂如丁香，根如胡桃。¶	The seeds are like those of the coir palm. The leaves have the fragrance of cloves while the roots are as those of the walnut.
其字，或从草，或从木，或草木并。 从草，当作“茶”，其字出《开元文字音义》；从木，当作“品”，其字出《本草》；草木并，作“茶”，其字出《尔雅》。	The character for tea, which we call cha, is sometimes made with "herb" as the significant element, sometimes "tree" and sometimes both. Its common name is varied with <i>chia</i> , <i>she</i> , <i>ming</i> or <i>ch'uan</i> .
其地，上者生烂石，中者生砾壤，下者生黄土。	Tea grows best in a soil that is slightly stony, while soil that is graveled and rich is next best.
凡艺而不实，植而罕茂。	Yellow clay is the worst and shrubs that are planted there will not bear fruit.
法如种瓜，三岁可采。	In planting and transplanting tea, the same techniques apply as for the melon, but the tea may not be picked until the plant's third year.
野者上，园者次；阳崖阴林，紫者上，绿者次；笋者上，芽者次；叶卷上，叶舒次。	Tea that grows wild is superior; garden tea takes second place. Whether grown on sunny slopes or in shady groves, the best leaves are russet. These are superior to the green leaves. Tea from the young and tender shoots in the plant's first flush is better than that from the buds. The best leaves are those which are tightly curled. Leaves that are open and unrolled are of second quality.
阴山坡谷者，不堪采掇。	Tea picked on the slopes or in the valleys of a sunless mountainside is not worth the effort.
性凝滞，结痼疾。茶之为用，味至寒，为饮最宜精行俭德之人。	Tea is of a cold nature and may be used in case of blockage or stoppage of the bowels. When its flavor is at its coldest nature, it is most suitable as a drink.
若热渴、凝闷、脑疼、目涩、四肢烦、百节不舒，聊四五啜，与醍醐、甘露抗衡也。	If one is generally moderate but is feeling hot or warm, given to melancholia, suffering from aching of the brain, smarting of the eyes, troubled in the four limbs or afflicted in the hundred joints, he may take tea four or five times. Its liquor is like the sweetest dew of Heaven.
采不时，造不精，杂以卉莽，饮之成疾，茶为累也。	One must guard against plucking tea out of season, manufacturing that does not catch its essence or adulterating it with other plants or herbs. Drinking tea under those conditions can only lead to illness.
亦犹人参，上者生上党，中者生百济、新罗，下者生高丽。	The injurious properties of tea are not unlike those of ginseng. We know that the best ginseng is produced in Shang T'ang, the medium grades in Po Chi or Hsin Lo while the poorest varieties also come from Korea.

30 《周易·系辞下》 (古时伏羲氏统治天下，仰头观察天上的物象，俯身观察大地的法则，观察鸟兽的斑纹以及地上适宜生养之物，近处取法于人体自身，远处取法于万物的形象，于是初始创作了“八卦”，以会通事物神妙显明的本质，以区分归类万物的情态。)¶	He selected symbols from the human body close by and from various objects far away, and then invented the eight trigrams to explain the miraculous nature and distinguish the states of all things. (The Book of Changes)¶
31 辩论。	Debate. The character <i>bian</i> (辩) denotes debate.
32 战国时期百家争鸣，各家都提出自己的学说。	The Warring States Period witnessed the contentions of the Hundred Schools of Thought.
33 出于学说之间的竞争，各家都力图通过对命题或论点的辩论来战胜论敌。	On this philosophical battlefield, theorists from rival schools participated in debates over numerous subjects or theses and overtime they began to consider debate as a philosophical subject.
34 因此，“辩”的问题逐渐受到关注，以后期墨家和荀子（前313?—前238）等为代表，对辩论的意义、原则、方法进行了广泛的讨论。	Some thinkers, especially the later Mohist scholars and Xunzi (313?-238 BC), discussed the significance, principles, and methods of debate.
35 不过，诸子中也有人持“辩”持谨慎或批评的态度。	Some others, however, treated it critically or with reservation.
36 如孟子（前372?—前289）即认为辩论是出于不得已，道家则反对辩论。	Mencius (372?-289BC), for one, said he would resort to debate only when he had no other choice. The Daoists, for another, spoke out against debate.
37 【引例1】辩，争彼也。辩胜，当（dòng）也。《墨子·经上》（辩，就是争论关于另一事物的是非。辩论获胜，就是获胜一方所主张的观点正确。¶	【CITATION 1】Debate is a form of arguing for what is right. The viewpoint of the winner is justified. (Mozi)
38 【引例2】公都子曰：“外人皆称夫子好辩，敢问何也？”	【CITATION 2】Gongduzi said, “You are reputed to love to debate. May I venture to ask the reason?”
39 孟子曰：“予岂好辩哉？予不得已也。《孟子·滕文公下》都子曰：“外面的人都说您喜好辩论，请问是为什么呢？”孟子说：“我难道喜欢辩论吗？我是不得已才辩论的。”	“I debate not because I love to but because I have to.” Mencius replied. (Mencius)
40 【引例3】今圣王没（mò），天下乱，奸言起，君子无鞅（shì）以临之，无刑以禁之，故辨说也。《荀子·正名》兵贵神速，拖久了就会节外生枝。	【CITATION 3】The sage kings have passed away long ago. As a result, the world has been thrown into chaos, where treacherous and vicious words easily go viral. The men of virtue have no authority to handle them and find no way to prohibit them by penalty. They can only resort to debate. (Xunzi)

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基于自建语料库实践并探究农业文化的传播新方式，构建以农业文化为主题的中英平行双语语料库，为农业文化英译教学和学习提供一手的教学资源。

(2) 农耕文化翻译相关实践教学

在自建农业文化双语语料的基础上，整合农业文化信息、文化内涵，并以视频、日志等形式记录语料库构建过程中的成员感想、整合相关耕读文化故事在多个媒体平台分享，并在校内举办耕读文化线下活动，立体化传播。此外，受学校浓郁三农氛围的影响，出于对农耕文化与专业的热爱，学生用独特的方式为农产品发声，让农产品说话，《如果农产品会说话》科创项目团队，制作以农产品自身为首要叙述主体的双语微纪录片——《如果农产品会说话》；同时从微纪录片延伸制作微信公众号以深入阐释中国农业文化，立体形象地展现农产品所蕴含的中国文化、中国价值及中国精神，促进中华优秀农耕文化创造性转化、创新性发展。

4. 结论

依据我校“厚基础、强能力、高素质”的创新农林人才培养目标，将知识传授、能力培养、素质教育和思维提升融入农业文化英译过程与教学实践环节中。语言智慧教学云平台、基于线上线下学习资源、科学的课程评价、有效的在线学习路径以及混合式教学模式，构成了农业文化英译系统的教学体系。“育人+智慧+实践”的语言教学范式在培养学生的自主学习能力和语言实践能力的同时，使外语教学体系成为培养学生外语综合应用能力、综合素质、实践能力、思辨能力和创新能力的有效载体，帮助学生提升思维模式、培养国际视野、增强农业文化自信、成为国际一流的创新型农林人才。