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CONTENTS

An Empirical Study of Errors in Chinese EFL Learners' Writing

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Abstract: Based on the theory of Error Analysis and the error classification of Carl James, this paper makes an analysis of the errors in the online writing of 19 minority preparatory students in a college in Beijing and explores the types of errors and underlying causes. The findings reveal: firstly, the proportion of substance errors was the highest, with spelling errors being particularly severe. The verb and article errors were more obvious in grammatical errors. Secondly, inter-language transfer and intra-language transfer were the main causes of errors, and inter-language transfer was more obvious. The findings complemented existing research on foreign language writing with third language learners' evidence. Some possible explanations in relation to these findings were discussed. In addition, implications for teachers and researchers of EFL were offered.
Keywords: English writing; Error analysis; Preparatory students; Language transfer

1. INTRODUCTION

The Belt and Road initiative has accelerated the deepening of external exchanges in China's ethnic minority regions. The demand for trilingual talents proficient in Mandarin, English, and a minority language has become increasingly urgent. Among these skills, proficiency in English writing has emerged as an indispensable competence for trilingual individuals. Preparatory education for ethnic minorities constitutes a distinctive tier within higher education and plays a crucial role in the overall higher education landscape, garnering gradual attention from national authorities and relevant departments. However, researches in this domain reveal inadequate attention from teachers towards addressing errors in student language learning, and a deficiency in providing accurate guidance [1]. This oversight is particularly evident in the myriad errors present in the English writing of ethnic minority students, indicative of a need for improvement in the quality of English language instruction. In light of these challenges, this study employs error analysis theory to investigate the errors in English writing among Uyghur ethnic minority preparatory students and to explore the underlying causes. The aim is to assist students in enhancing their writing skills, contributing to the cultivation of trilingual talents in the new era.

2. LITERATURE REVIEW

Error is defined as a deviation from the target language norms [2]. In the 1970s, Corder introduced the theory of Error Analysis (EA) as a replacement for Contrastive Analysis (CA), shifting the focus to the language actually used by students. Error Analysis theory is built upon the foundations of cognitive psychology and generative linguistics. Its objective is to analyze and evaluate errors made by students during language acquisition, aiming to identify the strategies they employ and the underlying reasons for the errors in the process of language learning. Scholars have explored various classifications of errors. Corder [3] initially made a distinction between errors and mistakes, later evolving into errors of competence and errors of performance. Errors of competence was further divided into intra-lingual and inter-lingual errors. It established the basic theoretical framework for error analysis. Richard [4] further categorized errors into inter-lingual errors, intra-lingual errors, and developmental errors, contributing to a significant impact in the field of education. Then, James [5] identified errors at three levels: substance errors, encompassing spelling, capitalization, and punctuation errors; text errors, including vocabulary and grammar errors; and discourse errors, involving coherence and pragmatics.

Numerous scholars have dedicated their efforts to the field of error analysis. Politzer & McGroarty [6] conducted a study on errors made by Czech English students in their compositions and found that assessing students' proficiency based on the types and frequencies of errors is a relatively effective method [6]. Other scholars, such as Zhang [7], investigated errors in graduate students' writing, and Jia [8] examined Chinese English students' errors in gerund collocation based on cognitive grammar. However, overall, the focus of error studies has predominantly been on second language students, with limited research addressing in the trilingual acquisition of ethnic minority university students.

Among the few studies conducted, Wang & Aimaiti [9] analyzed compositions from Uyghur university students, identifying errors as intra-lingual, inter-lingual, and unclassified, with inter-lingual errors being prevalent. Huang [10] took contrastive analysis and error analysis as theoretical frameworks, examining grammar errors at the morphological, lexical, and syntactic levels. The study revealed that errors were caused by both L2 Chinese and native language transfer. Wang[11], using Mongolian students as subjects, analyzed common errors in English writing at the lexical, grammatical, and sentence

structure levels, and the reasons of it.

However, the aforementioned studies predominantly focused on grammatical errors, overlooking other linguistic levels, and the exploration of error causes was not enough. Given these considerations, this study comprehensively analyzes the errors in Uyghur preparatory students' English writing and delves into their underlying causes. The study aims to address the following two questions:

(1) What are the most common types of errors made by Uyghur preparatory students in their English writing?

(2) What are the reasons behind the occurrence of errors in the writing of Uyghur English students?

3. RESEARCH DESIGN

3.1 Research participants

The research focuses on 19 Uyghur students from a minority pre-university program at a university in Beijing. These students participate in the National College Entrance Examination (NCEE) as ethnic minority candidates, utilizing the same examination papers as their Han Chinese counterparts. The linguistic and educational background of the participants is as follows: their native language is Uyghur, and they received education in Xinjiang before entering the pre-university stage. They commenced learning L2 Chinese from kindergarten. The majority of students initiated their English language studies in high school, with instructors delivering English classes in Mandarin during both high school and the pre-university stages.

3.2 Research tools

Writing tasks and retrospective interviews were used in this study. Utilizing a learning platform for online learning, data were collected on a learning platform on which participants were asked to finish a composition. The writing tasks were similar to College English Test-Band 4. This process was conducted over a three-week interval, with a total of four writing task assessments administered. The students were required to complete each writing task within one day. Subsequently, four representative students were selected for online retrospective interviews to obtain more detailed information. The interview protocol is outlined as follows:

(1) In your daily life, what language do you commonly use?

(2) Have you learned the basic norms of English? Have you studied the rules of English pronunciation?

(3) Taking "My favorite fruit" as the topic, please think about the essay. When you write it, do Chinese and Uyghur influence your writing?

(4) In your English learning, what types of mistakes do you often make? and what factors contribute to these errors? Could you elaborate on the particular errors in these four writing compositions.

(5) Do you carefully review the error feedback provided by the machine? What can the teacher do for you?

3.3 Research method and Data collection

Based on the theory of error analysis, the study followed the procedural framework proposed by Corder [12], which encompasses five stages: data collection, error identification, error categorization, error explanation, and error evaluation, to analyze the errors occurring in writing. Firstly, data were collected by 74 valid examination papers. Subsequently, a small-scale corpus of Uyghur minority writing was established, and errors were automatically identified through the Learning Platform and the received error detection reports were manually assessed. Thirdly, qualitative research tool Nvivo 20.0 was employed for coding and categorizing errors, referencing James's error classification, with subsequent quantitative analysis of error frequencies. Fourthly, the study investigated the patterns and underlying reasons for errors in writing. The results, together with pre-study findings, guided the formulation of interview protocols for in-depth interviews with four participants, providing further insights into the causes of errors. Finally, the fifth stage involved the analysis and discussion of the error outcomes.

4. RESEARCH RESULTS AND ANALYSIS

This study followed the framework of James's classification to conduct a quantitative analysis of errors. As shown in table 1, the statistics revealed that the total number of errors was 503, with 287 substance errors constituting the majority, accounting for 57% of the total errors. Among text errors, students were most prone to verb errors with 53 instances, which included errors related to tense, verb omission, and subject-verb agreement. Article errors ranked second with a count of 42, predominantly involving the omission of indefinite articles and the misuse of definite articles. Some errors, such as those related to word class, non-finite clauses, and adverbs, occurred less frequently and are not discussed further in the subsequent sections.

4.1 Substance Errors

Substance errors encompass spelling errors, capitalization errors, and punctuation errors. The investigation revealed that spelling errors were the most frequent and had discernible patterns, which would be discussed in subsequent sections. Due to the basic rules of capitalization and punctuation in English writing, this study categorizes them collectively for analysis.

Table 1 The number of errors in each classification

Types	Specific types	Number	Rank
Substance error	Capitalization	87	2
	Punctuation	63	3
	Spelling	137	1
Text errors	Work class	6	13
	Number of noun	11	11
	Tense	28	7
	Verb omission	12	10
	Subject-verb agreement	13	9
	Non-finite verb	8	12
	Preposition	30	6
	Article	42	4
	Pronoun	12	10
	Adverb	4	14
Discourse errors	Chinese way of thinking	17	8
	Run-on sentences	33	5

4.1.1 Spelling errors

Spelling errors primarily result from the phonetic transfer from the native language and the over generalization of target language rules. Firstly, they may be linked to students' mispronunciation of words [13]. An analysis revealed four predominant patterns as follows:

Example (1): The recollection of my childhood is like drem*.

Example (2): so every yer* they hoped that the spring fstival would come soon.

Example (3): For me, the most unforgettable experience of childhood shold* be about my father is car accident.

Example (4): I waw born in the contryside*, and i did not have many toys, just like other kids in may hometown.

In the examples mentioned above, omission of letters within vowel combinations is observed in the misspelling of words containing the letter combinations "ea", "ou", such as in the words "dream", "year", "should", and "countryside", where the combinations are pronounced as /iː/, /iː/, /ə/, and /ʌ/ respectively. Due to the lack of systematic exposure to phonetics and pronunciation rules, the participants possessed limited knowledge of the pronunciation rules associated with letter combinations in English. Moreover, Uyghur speakers often modulate long and short vowels based on contextual variations rather than fixed letter combinations; for instance, "*alma*" signifies "apple", while "*a—lma*" conveys "do not take". Consequently, when it comes to the pronunciation of vowel combinations, students tend to erroneously perceive it as a single-letter sound, leading to the omission of the second letter in vowel combinations.

Example (5): Family mean of so Mach* for me.

Example (6): Hlleo. everbady *I like footboll, my childhood time in footboll .

Example (7): English is very good klass*, I very like it.

In the composition, English letters were substituted with those from the native language or Mandarin Chinese sharing similar pronunciations. As noted by He [14], the majority of spelling errors among secondary school students were closely associated with pronunciations, a phenomenon possibly linked to negative transfer from L2 Chinese. Mandarin Pinyin and English share common letters in their written forms, yet their pronunciation systems diverge significantly. Due to participants in this study receiving bilingual education from an early age, Chinese exerts a profound influence, leading to instances where certain sounds in English bear resemblance to Mandarin Pinyin and share nearly identical spellings. Consequently, L2 transfer may occur in their English spelling. For instance, in the word "much", the /ʌ/ sound is represented by the Mandarin Pinyin letter "a", while in "class", the /k/ sound is represented by the Mandarin Pinyin letter "k". In "football", the /ɔː/ sound is represented by the Mandarin Pinyin letter "o". Additionally, Uyghur language incorporates loanwords similar in both spelling and pronunciation to English, such as "kamera-camera" and "kompeyoter-computer", further impacting the students. However, to ascertain whether these influences stem from their L1 Uyghur, L2 Chinese, or a combination of both requires further exploration into the sources of linguistic transfer.

Example (8): finaly* I hope every one can go back home to families get together to celebrate festivals, to injoy family's wearm.

Example (9): Yet l stil *can not forget the happy clay figuers when l was a little boy and was a prince in the family.

Example (10): I remenber incident that hapyed *in my childhood

In instances where a word contains two consecutive consonant letters and are pronounced as a single sound, there is a tendency to omit one of the consonant letters.

As the example (8) to (10) shown, students may misspell words like “finally”, “still”, and “happen” as “finaly”, “stil”, and “hapy”, respectively. This phenomenon arises from the negative transfer of L1 Uyghur, wherein the pronunciation of both consonant letters is required when they appear consecutively. Consequently, due to the negative transfer from Uyghur, there exists errors among Uyghur students to omit consonant letters in English writing.

Example (11): I like my childhood, evry bady childhood with good, my nam is kaisaier, i kan from xinjiang kashe, i lik *to be my jiaxing.

Example (12): From then on, colleg* has been my motivation for learning.

Example (13): I also remember the days when l fell sick and had to be confind* to bed.

Neglect the silent final vowel “-e”. Uyghur, belonging to the Altaic language and utilizing the phonetic script, lacks silent vowels at the end of words. Students, influenced by negative transfer from their native language, omitted the final “-e” in words such as “like”, “college”, and “confine”, resulting in spelling errors.

Secondly, spelling errors are also associated with an overgeneralization of target language rules. Overgeneralization refers to students applying the rules of the target language that they have learned, excessively transferring one grammar rule to another.

Example (14): she teach we tow class, so she extremely tird, but she never did not expresstion*, every day she play with we.

Example (15): Thousands of fireworkes* fly into the sky and use the most gorgeous flowers im my life.

Example (16): May perents were then the most unhappy persons* in the world.

In the examples (14) to (16), students demonstrated a linguistic competence of the nominal suffix “-tion” in words such as “tradition” and “invention”. However, there is a tendency to overlook the morphological variations of “-tion”. Specifically, when a verb ending in ‘t’ transforms into a noun, it typically concludes with “-tion”, while if verbs end with ‘s’ convert to nouns, they generally end with “sion”. The misspelling of the word “expresstion” was attributed to the overgeneralization of the “-tion” suffix. Furthermore, errors in the spelling of “Fireworkes” and “persons” result from the overgeneralization of pluralization rules, neglecting the nuanced application of either adding “-es” or “-s”, which indicated that participants in this study have not fully mastered the pluralization rule.

4.1.2 Capitalization errors and punctuation errors

Example (1): When i was a child,my parents once went to play with me.

Example (2): I learning english in hight school.

Example (3): i come from xinjiang china.

Example (4): hello,my name is osman.

The conventions of English writing encompass basic requisites, wherein punctuation, capitalization, spelling, and format constitute integral components of English writing pedagogy, but often overlooked by teachers and students[15]. From the writing production, it revealed a prevalent occurrence of the “run-on sentence” in punctuation usage. Fundamental rules of capitalization, such as inconsistencies in the capitalization of initial letters and proper nouns, remain inadequately mastered, leading to capitalization errors. Notably, within proper nouns, the errors involving the words “I” and “English” were more obvious. Insights derived from interviews attribute the phenomenon to two principal factors. Firstly, despite exposure to normative writing standards, participants performed an insufficient grasp of fundamental rules and tend to disregard their application in the practice. Secondly, unfamiliarity with online operations, with a majority of students mentioning limited computer use as a factor leading to discomfort with online typing. Addressing these challenges necessitates teachers emphasizing the significance of punctuation and capitalization in subsequent instruction, coupled with exercises designed to enhance students’ proficiency in online writing skills.

4.2 Text errors

4.2.1 Noun errors

Example (1): all the student* and teachers cried very sadly than day.

Example (2): my mother* and my fathers have many brother and sisters.

Example (3): The Spring festival is one of the traditionai festval* in China.

Noun errors predominantly included errors of word class and errors of number. Students always omitted the plural marker “-s” when forming plural nouns. This tendency can be attributed to the language transfers of Chinese and Uyghur, where the singular and plural forms of nouns remain unaltered when quantified, as exemplified in Chinese with phrases like “yibayaoshi” (one key) and “wubayaoshi” (five keys), where the word “yaoshi” (key) remains invariant. Similarly, in Uyghur, “ئالما” (an apple) and “شبه ئالما” (five apples), the form of “ئالم” (apple) does not changed. However, in English, as illustrated by “an apple” and “five apples”, the morphology of the noun “apple” necessitates modification by appending “-s” to denote plurality. Consequently, Uyghur students often exhibit a tendency to transfer patterns from their native language or Chinese when expressing plural nouns in English, inadvertently misusing the singular form.

4.2.2 Verb errors

Example (4): When I was a child, the most unforgettable thing was that I made medicine give my mother, when I was a child , I like* my mother so much ,so I did this.

Example (5): My two brothers very intelligent*.

Example (6): she help* me in my diffcult.

Verb errors predominantly included tense error, verb omission, and subject-verb agreement. Tense errors occur frequently in verb usage. In Uyghur, the tense of

the verb is achieved through verb forms and auxiliary words, while Uyghur verbs do not have tense and do not require changes in form. Under the influence of Uyghur, students are prone to making tense errors in composition. The omission of the linking verb is another common error. Linking verb connects the subject and the predicate, indicating the nature, characteristics, and qualities of the subject. In English, the auxiliary verb "is", "am", "are" must be consistent with the subject and cannot be omitted. In Uyghur, there are auxiliary verbs to express different persons, but these auxiliary verbs can be omitted. Therefore, Uyghur students are prone to omitting the linking verb under the influence of their mother tongue, such as in example sentence (5) My two brothers very intelligent, the verb "is" is omitted. In subject-verb agreement errors, English has a strict grammatical meaning, and the words should be consistent in terms of person, number, and case, and the verb endings should change for different persons. However, the Chinese verbs do not have inflection changes. Students are often influenced by Chinese, which leads to the inconsistency between the predicate and the subject. For example, in sentence (6), the student used "help" without changing the third-person singular form according to the subject.

4.2.3 Pronouns errors

Example (7): she *so beautiful and celever, all children like she, me too.

Example (8): she teach we tow class, so she extremely tird, but she never did not expresstion, every day she play with we* .

In English, personal pronouns have strict rules: the nominative case includes he, she, it, we, and they, and the objective case includes him, her, it, us, and them. The Chinese pronouns have a fixed character form and do not require changes in form regardless of the part of speech. In Uyghur, all third-person singular pronouns use the same word, and the pronouns need to be suffixed when they serve as the object instead of directly selecting the corresponding objective case form [16]. Therefore, minority students often confuse the nominative and objective case forms of pronouns. For example, in sentence (7), "all children like she" should be "all children like her", and the "we" in sentence (8), "every day she play with we", should be "us".

4.2.4 Article errors

Example (9): English is* very good klass, I very like it.

Example (10): I also have* unforgettable experrirnce

Example (11): No matter how busy they are, they will come home for the* dinner.

Example (12): However, family parties are usually at home because *most elder people don't like the noisy restaurants or pubs.

In Uyghur, the articles are rich but they are not always necessary, so they are inclined to be omitted. Therefore, Uygur students often make mistakes in the use of the article when learning English. The phenomenon of missing indefinite articles and misusing definite articles is more serious. For example, in example (9) and (10), the indefinite article "a" and "an" are missing, and in sentences (11) and (12), the definite article "the" is misused. The correct forms should be "come for dinner" and "the eldest".

4.2.5 Preposition error

Example (13): Family mean of so Mach for* me.

Example (14): I like New Year, people in the New Year's day, to stick couplets on* the Spring Festival.

Example (15): So young people should spend more time at* family ceremoines?

Prepositions are the most difficult part of speech for English students to master. For example, the Chinese word "zai" can be translated into English as "in", "on", "at", etc. It is difficult for Uyghur students to learn these words because there are no prepositions in Uyghur, and the relationship between nouns and other words depends on the "case" in Uyghur. For example, in Uyghur, The time, place, purpose, and manner in Uyghur are not expressed by prepositions but by the postposition word or case addition which is added after a noun [17]. Therefore, Uyghur students are prone to misuse prepositions, especially in the use of "zai". The preposition in Example (15) should be "at".

4.3 Discourse errors

Example (1): Unfortunately, on that day, it began to rain, we had to go back early.

Example (2): I this person is very special, unlike some people like quiet, where busy I went to drill.

Example (3): I hope my sister and brother can come back home in next year's spring festival, because can meet them is unusual thing, I very miss them.

The English language emphasizes sentence structure, utilizing various connecting devices to combine sentences. However, Chinese prioritizes the meaning of the words, and the sentence structure is often loose without the use of connecting words. Therefore, Chinese students are often influenced by Chinese logic thinking, and they often overlook the connecting devices in English. For instance, in the first sentence, the student did not use a connecting word to connect the sentence, which resulted in an incomplete sentence structure. The sentence should be "Unfortunately, it suddenly began to rain that day, so we had to go back early." The second and third sentences are influenced by the interference of Chinese thinking patterns. The second sentence is influenced by Chinese spoken language "wǒ zhè gè rén fēi cháng tè bié, bú xiàng bié rén xǐ huān ān jìng, wǒ xǐ huān rè nào", and the third sentence "because can meet them is unusual thing, I very miss them" is influenced by Chinese sentence "néng jiàn dào tā men shì bú róng yì de shì, wǒ fēi cháng xiǎng niàn tā men". These sentences directly translate Chinese into English without paying attention to the rules of English sentences, resulting in the discourse errors.

5. DISCUSSION

The results indicate that substance errors are the most severe among all errors, suggesting that errors caused by the neglect of fundamentals and rules among Uyghur students cannot be overlooked. This study found that spelling errors are the most severe among Uyghur students, reflecting a significant lack of English fundamentals among preparatory students, with substantial issues in word spelling. Uyghur students are influenced by interlingual transfer between their native language and Mandarin when creating vocabulary, that is, they creatively reconstruct the morphology and phonetics of the target language influenced by other languages [18]. Moreover, overgeneralization of target language rules also has an effect on spelling. This indicates that words related to phonetic learning, such as those with similar sounds and irregular verb forms are challenging for students to memorize [19]. Verb errors are also prominent in text errors, with tense errors being a frequently overlooked issue by students. Meanwhile, Shui [20] found that Uyghur college students exhibited text errors such as subject omission and inversion of the subject-verb-object order in their English compositions. Nonetheless, this study does not validate the aforementioned findings and further investigation is needed to explore specific reasons. The research reveals that interlingual transfer and intralingual transfer are the main causes of errors, with interlingual transfer playing a more noticeable role.

In addition to the factors of interlingual transfer and intralingual transfer, Uyghur students' writing is also affected by learning strategies and their affections. Through interviews, they reported that "Mandarin is encouraged in our school so I am inclined to generate English by the means of Chinese." and "Our English teacher teaches us English in Chinese, so we have developed Chinese-style English thinking". Due to the vigorous promotion of Mandarin by the government, students predominantly use Mandarin for communication, and years of Mandarin learning have led to the formation of Chinese-style English thinking pattern. As a result, many students employ a Chinese translation strategy to learn English, failing to develop an English thinking mode. Therefore, they tend to produce some English sentences that do not conform to grammar rules. In addition, anxiety is another factor contributing to errors. "I feel anxious as if there is no systematic process in my English learning. I am in a state of confusion." Students believe that anxiety is common during exams and has a bad influence on their English writing.

In response to the aforementioned findings, this study proposes the following recommendations: Firstly, the great importance should be attached to the positive transfer. Teachers are supposed to be adept at recognizing the similarities and differences among Uyghur, Mandarin, and English so as to tutor student English corresponding to those in Uyghur with similar forms and pronunciation to strengthen positive transfer from the native language. Meanwhile, it is also necessary to emphasize the differences between Uyghur and English to minimize negative transfer. Secondly, cultivating students' English thinking abilities is a necessity. Many students employ Chinese-style English thinking pattern when writing in English. During routine English writing training, teachers should pay attention to the development of their English thinking abilities. For instance, they can encourage brainstorming to associate English words, conduct simple and interesting short reading exercises and expand the input of authentic English reading and recitation materials. Thirdly, alleviating student's anxiety is also necessary. Interviews reveal that anxiety significantly impacts English learning. Teachers are expected to create a conducive learning environment to enhancing students' enthusiasm and proactivity in English learning. When necessary, a diversified feedback model combining online feedback, peer feedback, and teacher feedback is welcomed to provide comprehensive feedback to students, facilitating the maximum improvement of errors.

6. CONCLUSION

This study analyzes students' errors based on Uyghur students' English online writing, categorizes statistics on common errors and analyzes the causes. The results showed that substance errors were the most predominant, and lexical spelling was more severe and mostly related to phonological transfer. Among the text errors, verb errors and article errors are the most serious. The reasons for Uyghur students' writing errors were mainly attributed to intralingual and interlanguage transfer, but personal factors such as Chinese-style English thinking pattern and anxiety were also triggers for the errors. There are some limitations in this study, such as the length of time given for a single writing session and the lack of objectivity in determining the cause of errors. Future research could explore the extent of the influence of first and second language on trilingual transfer in writing errors based on the selection of students with different levels of native language and Chinese language proficiency, or utilize methods such as psychological experiments to further identify the sources of transfer. Students' writing errors is a serious and complex problem, and the results of this study provide some data on the aspect of Uyghur writing errors, which is expected to help improve Uyghur English writing and contribute to the cultivation of trilingual talents in the new era.

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REFERENCES

[1]Liu, X.H. (2008). A case study on analysis of errors

in English writing by non-English major students. Journal of Foreign Languages, (02): 140-142.
[2]Ellis, R. (1994). The Study of Second Language Acquisition. Oxford: Oxford University Press.
[3]Corder, S. P. (1967). The Significance of Student's Errors. International Review of Applied Linguistics in Language Teaching.
[4]Richards, J. C. (1974). Error Analysis: Perspectives on Second Language Acquisition. London: Longman.
[5]James, C. (2001). Errors in Language Learning and Use: Exploring Error Analysis. Beijing: Foreign Language Teaching and Research Press.
[6]Politzer, R., & McGroarty, M. (1985). An exploratory study of learning behaviors and their relationship togains in linguistic and communicative competency. TESOL Quarterly, 19: 10-23.
[7]Zhang, H.Y. (2012). Enlightenment of error analysis theory on English writing teaching for non-English major graduate students. Educational Theory and Practice, 32(15):48-50.
[8]Jia, G. M. (2017). Concept transfer analysis of Chinese English learners' verb-noun collocation errors. Foreign Language Teaching Theory and Practice, (01): 30-35+66.
[9]Wang, S. W., & Aimaiti. (2007). Analysis of English grammatical errors among Uyghur college students. Journal of Northwest University for Nationalities (Philosophy and Social Sciences Edition), (03): 129-133.
[10]Huang. L. (2010). Analysis of grammatical errors in the English compositions of Yi college students. Journal of Shanxi Normal University (Social Science Edition), 37(S3):74-76.
[11]Wang, M. H. (2014). A study on English writing errors of undergraduate students and the influence of mother tongue. Journal of Inner Mongolia Normal University (Educational Science Edition), 27(06):53-57.
[12]Corder, S. P. (1974). Error Analysis. In U. P. Allen & S. P. Corder (eds.), The Edinburgh Course in Applied Linguistics, Volume 3. London: Oxford University Press.
[13]Chen, J.L., & Li, X.Y. (2018). A study on the role of mother tongue and Chinese in Tibetan students' English trilingual writing. Foreign Language Teaching Theory and Practice, (03): 63-70.
[14]He, A. P. (2001). Analysis of students' English spelling errors. Foreign Language Teaching and Research, (03): 199-205.
[15]Yan, R. F., & Ma, L. (2016). Analysis of writing ontology errors in English teaching for non-English major Uyghur college students. Journal of Xingtuan Education College, 26(02):17-20+26.
[16]Gulimiela, Abduliti. (2011). A brief analysis of the negative transfer effect of Uyghur and Chinese in the English learning process of Uyghur college students. Journal of Changchun Institute of Education, 27(06): 83-84.
[17]Abduremu, Abuli. (2021). A Study on the Negative Transfer of Mother Tongue in English Vocabulary Learning of Uyghur Students in a Trilingual Background. Southwest University.
[18]Cenoz, J., Hufeisen, B., & Jessner, U. (Eds.). (2001). Cross-linguistic influence in third language acquisition: Psycholinguistic perspectives. Clevedon, UK: Multilingual Matters.
[19]Shi, Y., & Meng, X. Q. (2013). Using error analysis theory to guide high school English writing. Teaching and Management, (21):117-119.
[20]Shui, C. Q. (2008). Research on the phenomenon of language transfer in Uyghur students' English learning. Journal of Sichuan Vocational and Technical College, (02): 38-40.

The Role Evolution and Development of Social Organizations in Major Epidemics

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Abstract: As an integral part of the national emergency response system, social organizations in China have played a pivotal role in addressing significant emergencies. Since the 1990s, a series of texts have been introduced to regulate the involvement of social organizations in managing major epidemics. Based on the timing of text issuance and epidemic outbreaks, the historical process of social organizations' involvement in major epidemics can be divided into four stages. From the content perspective, social organizations have progressively transitioned from supporters to participants, from spontaneous to authorized actions, and from auxiliary social forces to key support forces in managing major epidemics. They have played an indispensable role in various aspects of epidemic prevention and control. However, challenges such as uncoordinated cooperation and weak connections between social organizations and the emergency response system remain. In the future, it is necessary to integrate social organizations more comprehensively into the emergency response system at the institutional level to better leverage the strengths of social forces.
Keywords: Social organizations; Major epidemics; Role evolution; Emergency response system; Social collaboration

1. INTRODUCTION

China has a long-standing social phenomenon of people forming informal groups for economic purposes and social demands. After the founding of the People's Republic of China, the state issued the "Interim Measures for the Registration of Social Organizations" in 1950 and the "Implementation Rules for the Interim Measures for the Registration of Social Organizations" in 1951 [1], defining informal organizations as "social groups" and placing them under the unified management of the Ministry of Internal Affairs (the predecessor of the Ministry of Civil Affairs) [2]. It was not until the "Government Work Report" of the State Council in 2004 that the term "social organizations" was first used. Similar to the "non-profit organizations" and "third-sector organizations" in Western countries, social organizations in China mainly refer to various legally registered formal organizations that are distinct from government and market profit organizations, participate in social service activities with mutual aid and public welfare as their goals, and are characterized by non-profit, non-governmental, and social attributes.

The Ministry of Civil Affairs, with management functions for social organizations, was officially established in 1978. However, due to the incomplete institutional construction in the early stages of social organization management, the Ministry of Civil Affairs could not effectively regulate and manage various social organizations. It was not until the institutional reform of the State Council in 1998, when the Bureau of Social Organization Administration was officially established in the Ministry of Civil Affairs and regulations on social organization management were gradually introduced, that the management of social organizations in China began to get on the right track. Since the reform and opening up, with the transition of the national economic system from "planning" to "market," social organizations in China have begun to flourish. The first non-governmental public welfare organization, Friends of Nature, was established in China in the 1990s. The holding of the 1995 Beijing World Conference on Women brought the concept of non-governmental organizations (NGOs) to China. In 2003, social organizations supported the nation's fight against the SARS epidemic. In 2008, social organizations participated in the rescue efforts for the Wenchuan earthquake. In 2016, the first "Charity Law" was introduced. These landmark historical events mark different stages in the development of modern social organizations in China. With the continuous development and growth of various social organizations, their importance in participating in social governance has gradually become evident, especially in major public crises such as earthquakes and epidemics, where social organizations can quickly intervene with flexibility and professionalism to achieve good results [3].

However, due to China's long-standing governance model of "big government, small society," social organizations often face numerous restrictions from the government when participating in the governance of major social crisis events. Under the "dual management system," whether social organizations can participate in major crisis events fundamentally depends on the policy permission and institutional empowerment of the government. Therefore, to understand the role evolution and development of social organizations in major epidemics in China, it is

necessary to consider the influence of social policy factors. Moreover, comparative analysis shows that the involvement of social organizations in health crises varies significantly across different countries [4], under the "campaign-style governance," China often centralizes control and coordinates all parties in the face of major disasters. Therefore, in the analysis of policy texts, it is important to focus on the policy texts of the central government. This paper analyzes the historical process and characteristics of the role evolution of social organizations in major epidemics based on the development of social organizations in China since the 1990s and the central policy texts during major epidemics. It also attempts to summarize the problems and reflections of social organizations in handling major epidemics and provides optimization paths for better participation of social organizations in the governance of major public crisis events.

2. HISTORICAL PROCESS OF SOCIAL ORGANIZATIONS' INVOLVEMENT IN MAJOR EPIDEMICS IN CHINA

Since the 1990s, with the strengthening of social organization management in China, the regulations governing social organizations' participation in major social events have become increasingly refined [5,6]. Based on the timing of major epidemics and the extent of policy empowerment for social organizations to participate in handling major epidemic events, the historical process of social organizations' involvement in major epidemics can be divided into four stages [7,8].

2.1 From the 1990s to 2002: The Initial Stage of Social Organizations' Participation in Social Governance

In the 1990s, social organizations in China developed rapidly, especially industry associations, foundations, and foreign chambers of commerce. The state recognized the functions of these organizations in social fundraising and industry material integration. As early as 1988, the "Regulations on the Management of Foundations" were promulgated. To further strengthen the regulation of social organizations' fundraising and usage, the State Council issued the "Red Cross Society Law" in 1993 and the "Public Welfare Donations Law" in 1999, specifying the scope and methods of social organizations' use of public welfare funds. After the 1995 World Conference on Women in Beijing, influenced by the concept of NGOs, there was a wave of social organization establishment in China. More and more public welfare foundations and industry associations became involved in environmental protection, public health, social education, and rural development. They legally raised and used social donations within the constraints of laws and regulations. However, at that time, the government still did not trust and rely on social organizations, and they were not involved in major epidemics. For example, the "National Disaster Reduction Plan (1998-2010)" issued by the State Council in 1998 did not mention the participation of social organizations in disaster relief. Nevertheless, it is undeniable that the state began to regulate social organizations' use of social material integration capabilities in social construction, laying the foundation for their future involvement in handling major epidemics.

2.2 From 2003 to 2007: The Initial Involvement of Social Organizations in Handling Major Epidemics

In 2003, the SARS outbreak occurred in China. Due to the strong contagiousness and high fatality rate of the SARS virus, it caused global epidemic panic. Due to the imperfect emergency management mechanism, the Chinese government was under pressure in facing the SARS epidemic. During the "SARS" outbreak, social organizations represented by the Red Cross Society of China and the China Charity Federation began to participate in epidemic handling, demonstrating strong social material integration capabilities. On May 3, 2003, the General Office of the State Council issued the "Notice on Strengthening the Management of Social Donations for the Prevention and Treatment of Atypical Pneumonia," specifying that, in addition to the Ministry of Civil Affairs and the Ministry of Health, the Red Cross Society of China and the China Charity Federation were also designated as official social donation recipients. During the "SARS" period, the Ministry of Civil Affairs received 743 million yuan in social donations, while the China Charity Federation and the Red Cross Society of China received 1.403 billion yuan and 833 million yuan, respectively, demonstrating strong social mobilization capabilities. In the fight against the epidemic, the Chinese Medical Association and the Chinese Medical Doctor Association, relying on their professionalism, conducted "SARS" prevention and control publicity on various TV media and actively communicated with international relevant prevention and control institutions. To strengthen scientific research cooperation in prevention and control, the Office of Taiwan, Hong Kong, and Macao Affairs of the Ministry of Health issued a letter on May 19, 2003, allowing cross-strait medical organizations to conduct academic discussions on SARS prevention and control.

During the "SARS" epidemic prevention and control, a large number of social organizations began to play to their strengths and actively participated in event handling. On July 8, 2003, the Ministry of Civil Affairs issued the "Decision on Commending Advanced Civil Organizations in Fighting SARS," deciding to award the titles of "Advanced National Social Organizations in Fighting SARS" to the Chinese Medical Association, the Chinese Medical Doctor Association, and the Chinese Hospital Association, and the title of "Advanced Private Non-Enterprise Units in Fighting SARS" to the New Exploration Health Development Research Center and

others. The decision pointed out that social organizations played an important role in fundraising relief materials, conducting public education, and discussing prevention and treatment plans during the epidemic. After experiencing "SARS," the national level began to open up for social organizations to participate in the handling of major emergency events. The "Opinions of the State Council on Fully Strengthening Emergency Management Work" issued on June 15, 2006, stated that social organizations should be encouraged to provide financial, material donations, and technical support for responding to public emergencies. The "Notice of the National Comprehensive Disaster Reduction 'Eleventh Five-Year' Plan" issued on August 5, 2007, further required the integration of social organizations into the construction of the national disaster emergency rescue system and disaster reduction professional teams. This indicates a shift in the government's attitude towards social organizations from "distrust and unease" to "allowing them to participate in cooperation." Relevant institutional regulations have opened the "convenient door" for social organizations to participate in handling major epidemics.

2.3 From 2008 to 2015: Widespread Involvement of Social Organizations in Handling Major Epidemics

In 2008, China experienced the most destructive earthquake since its founding—the Wenchuan earthquake. After the earthquake, social organizations responded quickly and entered the disaster area for rescue, giving rise to a large number of outstanding grassroots rescue organizations such as the Blue Sky Rescue Team. During the earthquake relief process, the Friends of Nature organization, with its expert judgment, called for close attention to the Tangjiashan barrier lake, drawing the government's attention to the secondary disasters caused by the earthquake. This disaster relief effort made the government fully aware of the rapid and professional emergency rescue capabilities of social organizations, and subsequently, social organizations were gradually incorporated into the national emergency rescue system construction.

In 2009, the H1N1 influenza outbreak occurred in China. After the 2003 SARS epidemic, the Chinese government quickly adopted a series of prevention and control strategies and measures, proposing the principle of "high attention, active response, joint prevention and control, and scientific and legal handling," effectively curbing the spread of the disease. During this epidemic, due to the government's strong prevention and control measures, there were fewer policy documents allowing social organizations to participate in handling the epidemic. However, from relevant news reports, we can see that social organizations still played a role in integrating materials and providing technical support during this epidemic. Furthermore, we can infer the role of social organizations in this epidemic from subsequent related documents. According to the "Report on the Implementation of the Infectious Disease Prevention and Control Law and the Prevention and Control Work of the State Council" released in 2013, it is pointed out that social organizations should be guided to carry out publicity and behavioral intervention for infectious disease prevention and control, build a bridge between the government and the public, and explore government purchasing services and other means to support social organizations in assisting the government in infectious disease prevention and control work. The same year's "Guiding Opinions on Government Purchasing Services from Social Forces" includes increasing the government's purchase of services from social forces in the fields of social security and medical and health care. To some extent, this indicates that social organizations have been able to participate in behavioral intervention and prevention and control publicity for infectious diseases, and the government is trying to support the development of social organizations through purchasing services, providing an institutional foundation for their future comprehensive participation in major epidemic prevention and control.

2.4 From 2016 to Present: Comprehensive Involvement of Social Organizations in Handling Major Epidemics

The "Charity Law of the People's Republic of China," which came into effect on September 1, 2016, is an important milestone in the development of social organizations in China. The Charity Law stipulates that public welfare organizations can be directly registered with the local civil affairs department, breaking through the "dual management system," and provides tax incentives for charitable organizations, greatly promoting the development of public welfare organizations. It also allows public welfare organizations to obtain fundraising qualifications within two years of establishment, further strengthening the social material integration capabilities of social organizations. On February 24, 2018, the Ministry of Civil Affairs announced the "Management Measures for Social Organization Credit Information," which, through credit incentives and dishonesty penalties, increases the cost of violations and the intensity of punishment, strengthens credit constraints, and forces social organizations to enhance self-discipline in integrity construction. By leveraging creditworthy social organizations, government-authorized and entrusted tasks and government-purchased social organization service projects can be better implemented.

In 2020, the outbreak of the novel coronavirus (COVID-19) occurred in China, and social organizations were fully involved in the frontline battle against the epidemic. At the very beginning of the outbreak, the Ministry of Civil Affairs issued the "Announcement on Mobilizing Charitable Forces to

Participate in the Prevention and Control of the Novel Coronavirus Pneumonia Epidemic in an Orderly Manner According to Law," calling on social organizations to play their role in social mobilization, take measures to support Wuhan's epidemic prevention and control, and designate five social organizations including the Hubei Provincial Red Cross Society, Hubei Provincial Charity Federation, Hubei Provincial Youth Development Foundation, Wuhan Charity Federation, and Wuhan Red Cross Society as the recipients of social donation materials. On February 10, the "Notice on Business-Managed Social Organizations under the Ministry of Civil Affairs Playing a Leading Role in Responding to Public Concerns in Participating in Epidemic Prevention and Control Work" required business-managed social organizations to actively respond to public concerns, establish a donation data statistics and information reporting system during the epidemic prevention and control period, and extensively publicize the important instructions of the national prevention and control work. On March 6, the central government called for guiding social organizations to actively provide psychological assistance to epidemic treatment personnel and their families through telephone, WeChat, and other means. Subsequently, on March 13, the Ministry of Civil Affairs issued the "Notice on Business-Managed Social Organizations under the Ministry of Civil Affairs to Actively Contribute Further in Coordinating the Prevention and Control of the Epidemic and the Economic and Social Development," requiring social organizations to actively protect vulnerable groups and assist urban and rural communities in joint prevention and control. At the same time, industry organizations were asked to guide and help enterprises resume work and production of epidemic prevention materials, and volunteer organizations were encouraged to leverage their social work advantages to provide psychological counseling, support services, and other services to the public. In this epidemic, social organizations were fully involved in the government's COVID-19 prevention and control work, playing important roles in social material integration, regional prevention and control, psychological counseling, technical support, disease treatment, data reporting, and prevention and control publicity, providing significant support for the government's scientific response to the COVID-19 epidemic, as has been observed in other studies on social organizations and public health during the pandemic [9].

3. THE ROLE EVOLUTION OF SOCIAL ORGANIZATIONS IN HANDLING MAJOR EPIDEMICS IN CHINA

From the involvement of social organizations in handling major epidemic events in China, it is evident that social organizations have gradually gained official trust from the government and have been incorporated into the national public health emergency system construction. The role of social organizations in handling major epidemics has also undergone significant changes.

3.1 From Supporters to Cooperators to Participants

Before the outbreak of SARS, the state did not pay much attention to the participation of social organizations in epidemic handling, mainly advocating social organizations to play a role in social mobilization, integrating social donation materials to provide material support for the nation's epidemic fight, acting as supporters. However, during the SARS outbreak, social organizations not only helped the government quickly raise anti-epidemic materials but also some medical field social organizations played their professional advantages to provide scientific suggestions for government prevention and control, offering intellectual support for government decision-making. Since then, the government has encouraged social organizations to provide financial, material donations, and technical support for responding to public emergencies and proposed the idea of integrating social organizations into the emergency system construction. During the H1N1 influenza epidemic, social organizations were further involved in behavioral intervention and prevention and control publicity, cooperating with the government's anti-epidemic efforts, gradually evolving from supporters to cooperators in handling major epidemic events. Since 2013, the government has established a good cooperative relationship with social organizations in the field of emergency management through service purchasing and policy support. In the current COVID-19 epidemic, social organizations responded to the national call, deeply participated in the frontline of epidemic prevention and control, and played an important role in various aspects such as material integration, regional control, psychological counseling, technical support, disease treatment, data reporting, and prevention and control publicity, realizing the transition from cooperators to participants in handling major epidemics.

3.2 From Spontaneous to Task-Oriented to Empowered

Social organizations have spontaneity, so in the early stages of participation in major epidemic prevention and control, social organizations mainly organized spontaneously, mobilizing social forces in their respective industries and fields to raise materials and voluntarily participate in epidemic prevention and control. After the SARS outbreak, under the emergency management system that was difficult to cope with, the government allowed organizations such as the Red Cross Society of China and the China Charity Federation to help the country integrate relief materials through entrustment, and these organizations played an important role in raising relief materials in various major events. However, since these organizations have official nature and bear the mission

of responding to emergencies, they belong to task-oriented social organizations. This indicates that some social organizations in China have evolved from spontaneous participation to task-oriented participation in handling major epidemics. After the COVID-19 outbreak, based on the government's purchase of services relationship with social organizations, the government mobilized social organizations to participate in psychological counseling and prevention and control publicity for epidemic patients, and also issued relevant documents to empower social organizations to participate in regional control and epidemic elimination. After this epidemic, the participation of social organizations in major epidemics has also evolved from mainly task-oriented to mainly empowered, with more organizations participating in epidemic handling through government empowerment.

3.3 From Auxiliary Social Forces to Important Support Forces

From the Seventeenth National Congress of the Communist Party of China (CPC) clearly stating, "Improve the emergency management system, perfect the social management pattern of party committee leadership, government responsibility, social coordination, and public participation, improve the grassroots social management system," to the "Guiding Opinions on Strengthening the Construction of the National Disaster Information Officer Team" jointly issued by the Ministry of Emergency Management and other departments in 2020, stating that social forces are an important force in disaster relief and incorporating social forces into the construction of the disaster information officer team, social organizations in China have gradually evolved from auxiliary forces in handling major epidemic events to pillar forces. Since 2013, China has started to use the term "social forces" to define the governance role of social organizations, reflecting the importance the state attaches to the participation of social organizations in handling major public crisis events. Different from the past participation only during the outbreak of epidemics, with the improvement of China's emergency system, social organizations have been able to fully participate in the early detection, outbreak prevention and control, and post-disaster management of epidemics, similar to the expanded model of nonprofit organizations in disaster response as observed globally [10], gradually evolving from auxiliary participants to important support forces in major epidemic governance.

4. ISSUES AND FUTURE DEVELOPMENT OF SOCIAL ORGANIZATIONS' INVOLVEMENT IN HANDLING MAJOR EPIDEMICS

Social organizations in China have gradually participated in the handling of major epidemics and supported and cooperated with the government in carrying out anti-epidemic work, achieving good results. However, there are still some issues in the involvement of social organizations in handling major epidemics. From the perspective of the government, there is insufficient coordination between the government and social organizations in participating in epidemic treatment, and the related docking work is not in place, resulting in situations where social organizations encounter investigations and obstructions from relevant departments, and even conflicts, when delivering materials and conducting community prevention and control during the epidemic. Additionally, the government prefers to use social organizations as channels for integrating social resources rather than involving them in specific event handling, and the number of social organizations allowed to participate in epidemic handling is still limited, with limited space for participation. In the recent COVID-19 epidemic, the national level mainly mobilized "ministerial-level social organizations," which are mostly official in nature or have good development trends, while other social organizations have difficulty participating in major epidemic handling and remain excluded from event handling. From the perspective of social organizations, they face issues such as insufficient coordination, low professionalization, and lack of public trust, reflected in the epidemic handling where most social organizations operate independently without coordinating with same-industry organizations to integrate donated materials or leverage professional expertise, leading to scattered social resources. In epidemic handling, some social organizations' volunteer training is inadequate, preventing effective involvement in epidemic prevention and control and emergency treatment, and even hindering rescue efforts. During the anti-epidemic process, some social organizations also encounter trust crises. For example, the Wuhan Red Cross Society faced strong public dissatisfaction due to issues such as unreasonable distribution of relief materials and high procurement prices during the COVID-19 epidemic, severely affecting the ability of social organizations to integrate materials.

However, it is undeniable that China is striving to integrate social organizations into the national emergency management system to maximize the use of social forces in handling major epidemics. Strengthening professional emergency capacity building, expanding social participation channels, and enhancing government purchasing are important measures for the future government to promote social organizations' better involvement in handling major epidemics. The country has issued relevant regulations to include social organization personnel in the construction of grassroots emergency information officer teams, allowing social organizations to participate in grassroots epidemic monitoring, quickly report information in the early stages of epidemics, and take professional measures for prevention and

control during outbreaks. At the same time, the government allows professional social organizations to participate in the collection and release of epidemic data and information, participate in the formulation of government prevention and control policies, and supports the development of social work organizations through government purchasing to enhance their capabilities in psychological counseling and post-disaster treatment, enabling social organizations to more comprehensively participate in the process of major epidemic prevention and control. It is evident that the government and social organizations are moving towards dialogue and cooperation, and in the future, social organizations in China will be fully involved in the handling of major social crisis events, becoming an important force in social governance.

5. CONCLUSION

This paper has examined the evolving role of social organizations in handling major epidemics in China, tracing their development from the 1990s to the present. It is clear that social organizations have transitioned from being mere supporters to becoming key participants in the nation's emergency response system. Their roles have expanded from spontaneous involvement to being authorized and empowered entities, contributing significantly to various aspects of epidemic prevention and control.

Despite their growing importance, challenges remain. These include uncoordinated cooperation between the government and social organizations, limited participation space for non-official organizations, and issues of public trust and professionalism within some social organizations. To address these issues, the government needs to enhance coordination, expand participation channels, and strengthen the professional emergency capacity of social organizations.

Looking ahead, it is crucial for the government to integrate social organizations more comprehensively into the emergency management system. By doing so, the strengths of social forces can be leveraged more effectively, enabling a more coordinated and efficient response to major epidemics. As social organizations continue to evolve, their involvement in handling major social crises is set to become an indispensable component of China's social governance system.

By strengthening the collaboration between the government and social organizations and enhancing the professional capabilities of these organizations, China can better harness the power of social forces in managing major public health crises. This will not only improve the country's emergency response mechanisms but also contribute to the overall resilience and well-being of society.

REFERENCES

[1] Xie Ju, Ma Qingyu. A Review of the Development of Social Organizations in China, Journal of Yunnan Administration College, 2015, 17(01):35-39.

[2] He Shui. Chinese Social Organizations: Growth Process and Current Situation, Theoretical Guide, 2013(05):21-23+112.

[3] Levkovich I, Shinan-Altman S. The influence of emotional reactions and compliance with Ministry of Health guidelines during the COVID-19 pandemic in Israel: a longitudinal study of gender differences, Global Health Promotion, 2024: 17579759231218004.

[4] Bailey A, Harris M A, Bogle D, et al. Coping With COVID-19: Health risk communication and vulnerable groups, Disaster medicine and public health preparedness, 2023, 17: e22.

[5] Zhao Jiajia. Analysis and Definition of Concepts Related to Social Organizations, Administration and Law, 2017(6).

[6] Zhang Baoku. The Chinese Hospital Management Association Named Among the Advanced Civil Organizations in Fighting SARS by the Ministry of Civil Affairs, China Hospital, 2003, 7(9).

[7] Zhang Yi. Research on Government Emergency Management in Public Health Emergencies, Jilin University, 2011.

[8] Li Bin. Report of the State Council on Infectious Disease Prevention and Control Work and the Implementation of the Infectious Disease Prevention and Control Law, Capital Public Health, 2013, 007(005):193-195.

[9] Khanna R C, Cicinelli M V, Gilbert S S, et al. COVID-19 pandemic: Lessons learned and future directions, Indian journal of ophthalmology, 2020, 68(5): 703-710.

[10] Pöyry E, Reinikainen H, Luoma-Aho V. The role of social media influencers in public health communication: Case COVID-19 pandemic, International Journal of Strategic Communication, 2022, 16(3): 469-484.

The Value Embodiment of Curriculum Ideological and Political Ideas in Mathematics Classroom Teaching

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Abstract: With the deepening of education reform, ideological and political education has gradually become one of the key words of education and teaching. It is a major measure of education reform and helps to promote the development of Ideological and political education in Colleges and universities. In mathematics classroom teaching, the value of curriculum ideological and political education has also received more and more attention. The use of curriculum ideological and political ideas and resources can sublimate the connotation of the curriculum and return to the original intention of College Ideological and political education. Mathematics, as an abstract science, is often regarded as irrelevant to ideological and political education. It is common that the content of Ideological and political education is not appropriate enough, the teaching method shows the characteristics of "hard implantation", and the teaching effect is not obvious. However, in fact, in mathematics classroom teaching, the application of Ideological and political concepts can help students better understand mathematics knowledge, cultivate students' innovative thinking and practical ability, and enhance students' sense of social responsibility and patriotism. Therefore, this paper focuses on the value of the ideological and political ideas in mathematics classroom teaching, and discusses the effectiveness of the application of the ideological and political ideas in mathematics curriculum from the aspects of innovating teaching forms, enriching classroom content, and teachers' words and deeds.

Keywords: Curriculum Ideological and Political Education, Mathematics Classroom, Application Value

1. INTRODUCTION

Curriculum ideological and political education is one of the important directions of education and teaching reform in the new era, which refers to the idea of education and teaching that focuses on cultivating students' Ideological and moral quality, humanistic quality and social responsibility in the aspects of curriculum setting, teaching content, teaching methods and teaching evaluation, so as to promote the all-round development of students. In mathematics classroom teaching, mathematics is an abstract science, which is difficult to learn and easy to make students feel tired of learning. In the actual teaching, there are many problems in the use of curriculum ideological and political resources by mathematics teachers, such as less resource development, unreasonable use, inflexible use of resources, etc. Therefore, it is of great significance to improve students' learning enthusiasm and promote their all-round development by using the ideological and political concept of the course to guide students' Ideological and moral quality and social responsibility while learning mathematics knowledge. At the same time, with the deepening of education and teaching reform, curriculum ideological and political education has also received more and more attention in mathematics classroom teaching [1]. We should deeply understand the connotation of curriculum ideological and political resources from different angles, explore more channels that can develop curriculum ideological and political resources, innovate the carrier of curriculum ideological and political resources, deeply understand the concept of curriculum ideological and political education, and imperceptibly integrate it into mathematics classroom teaching. Therefore, it is of great significance to explore the practical application

and value embodiment of Ideological and political education in mathematics classroom teaching.

2. THE CONNOTATION OF CURRICULUM IDEOLOGICAL AND POLITICAL EDUCATION IN MATHEMATICS TEACHING

2.1. Development course

The development of curriculum ideological and political education in mathematics teaching can be traced back to the late 1980s and early 1990s. At that time, the Ministry of education put forward the educational policy of "paying equal attention to moral education and intellectual education", requiring that all disciplines should pay attention to the cultivation of students' Ideological and moral quality. With the deepening of education reform, ideological and political curriculum has gradually become an indispensable part of mathematics teaching. In this process, mathematics teachers began to pay attention to the cultivation of students' Ideological and moral character, as well as the understanding and understanding of social, national and human development.

With the continuous updating of the new curriculum standards, the position of Ideological and political education in mathematics teaching is becoming more and more important [2]. The new curriculum standard emphasizes that mathematics education should cultivate students' innovative ability, practical ability and social responsibility, which is also consistent with the goal of Ideological and political education. Under the guidance of the new curriculum standard, mathematics teachers can better integrate the ideological and political education into teaching, cultivate students' Ideological and moral character and social responsibility through teaching content, teaching methods and teaching evaluation, and make them become all-round talents.

2.2. Main problems

The use of curriculum ideological and political ideas helps to change the traditional teaching mode and thinking, but there are also many problems in the process of application. First of all, from the main body of teachers. Mathematics professional teachers are the main body of the implementation of curriculum ideological and political education. From the analysis of teachers' moral education consciousness, moral education quality and moral education ability, it is found that most teachers lack moral education consciousness, moral education ability is low, moral education quality is not high, and teachers' teaching energy is limited when limited by class hours, so it is difficult for teachers to achieve good moral education effect, which hinders teachers' use of curriculum ideological and political resources in professional courses. Secondly, teachers' enthusiasm and initiative of real-time curriculum ideological and political education in mathematics classroom teaching are low, and a reasonable driving mechanism is needed to mobilize teachers' enthusiasm. Moreover, the evaluation mechanism of curriculum ideological and political education in the classroom has not been established, and the evaluation form is single, which is not conducive to improving the effectiveness of curriculum ideological and political education. From the perspective of curriculum, teachers have different ways to implement ideological and political education in different nature of curriculum. Mathematics teaching content and teaching system are more complex, the logical relationship of knowledge is more rigorous, but it is also difficult to mine the ideological and political elements of the course. Most of the teaching methods are formulas, so it is very important to integrate the ideological and political content of the course, but it is also difficult to integrate the ideological and political elements of the mathematics course. Finally, the implementation of mathematics ideological and political course is easily affected by many factors, so we should grasp the problem of mathematics ideological and political teaching. Students' acceptance of the ideological and political content of the course integrated into the classroom is not high, and their feelings are not deep enough. Therefore, we should strengthen the combination of theory and practice, and improve the teaching effect of Integrating Ideological and political education into mathematics.

2.3. Connotation analysis

The literal meaning of "Course Ideological and political education" is to integrate ideological and political education into the teaching of various courses, guide students to enhance moral cultivation, improve ideological quality, enhance social responsibility and innovation spirit, and cultivate students' comprehensive development and practical ability through the teaching activities of the course. The course of Ideological and political education in mathematics teaching refers to that in mathematics classroom teaching, we should pay attention to cultivating students' Ideological and moral quality and values, guide students to establish a correct outlook on life, world outlook and values, and promote students to grow into citizens with high cultural literacy and social responsibility. Specifically, the ideological and political education in mathematics teaching should include the following aspects: emphasizing the social significance, role and historical status of mathematics, stimulating students' interest and love in mathematics; Cultivate students' ability to explore and solve problems, and emphasize scientific spirit and innovative consciousness; Strengthen the quality education for students, pass on positive values, and cultivate students' healthy psychological state and stable emotions; Strengthen students' sense of social responsibility and civic awareness, and pay attention to the cultivation of students' teamwork ability and communication ability. The application of curriculum ideological and

political ideas helps to achieve the task of moral education and cultivate high-quality talents for the society. The integration of curriculum ideological and political ideas into mathematics classroom teaching plays a key role in improving the quality of higher education, especially the quality of school running [3]. It can also improve the effect of school moral education and promote the all-round development of students. The teaching of professional courses in Colleges and universities should bear the responsibility of cultivating students' core values. The classroom with ideological value is a valuable and meaningful classroom. Therefore, mathematics teachers should follow the educational philosophy of teaching and educating people, respect students' dominant position, and correctly guide students' values while cultivating students' learning ability in the process of imparting knowledge, so as to cultivate students' Ideological and political literacy, At the same time, it helps to cultivate students' innovation ability and team cooperation ability. In a word, the curriculum ideological and political education in mathematics teaching aims to guide students to form a correct outlook on life, world outlook and values, cultivate students' comprehensive quality, and help students' growth and development in the future through mathematics classroom teaching.

3. THE SIGNIFICANCE OF IMPLEMENTING IDEOLOGICAL AND POLITICAL EDUCATION IN MATHEMATICS TEACHING

It can be seen that the ideological and political course is of great importance to the future development of China, and it is a work of strategic value and long-term significance.

3.1. Developing ideological and political education is the essential requirement of cultivating socialist successors

The socialist core values are the spiritual pillar of socialism with Chinese characteristics and the concentrated embodiment of the combination of the excellent traditional culture of the Chinese nation and modern civilization. Under the historical conditions of profound changes in the current economy, politics, culture and other aspects, ideological and political courses can effectively guide students to establish a correct world outlook, outlook on life and values, and play an important role in the comprehensive training. The implementation of curriculum ideological and political education can better play the function of education and education, enable students to have humanistic quality, scientific quality and international vision, and improve their comprehensive quality to adapt to the rapidly changing social environment. This is the basis for training socialist builders and successors. To sum up, the development of Ideological and political courses is the essential requirement of cultivating socialist builders and successors, and has important practical and far-reaching historical significance for promoting the cause of socialism with Chinese characteristics.

3.2. Developing curriculum ideological and political education is the core mission of strengthening school ideological and political construction

Developing curriculum ideological and political education is the core mission of strengthening the ideological and political construction of schools, because curriculum ideological and political education is one of the important ways for students to understand the world, master knowledge, form attitude and shape personality. Through the course of Ideological and political education, students can enhance their ideological and moral cultivation and comprehensive quality while learning professional knowledge, imperceptibly affect their values, outlook on life and world outlook, and cultivate them to become young people of the new era with noble morality and social responsibility [4]. Curriculum ideological and political education can also help schools achieve educational goals, promote educational reform and innovation, improve the quality and level of education, and promote national development and progress. Therefore, the development of curriculum ideological and political education is an important task and mission to strengthen the ideological and political construction of schools.

3.3. Developing curriculum ideological and political education is the necessary guarantee to promote the comprehensive development of students

The course of Ideological and political education can help students establish a correct outlook on life, values and the world. In modern society, people are faced with various temptations and challenges. Without a correct outlook on life, values and the world, it is easy to lose their direction. Through the course of Ideological and political education, students can receive scientific, reasonable and positive ideological education, so as to improve their quality and ability. Secondly, the course of Ideological and political education can cultivate students' comprehensive quality. The requirements of modern society for talents are no longer a single skill and knowledge, but pay more attention to the cultivation of comprehensive quality. As an interdisciplinary subject, the course of Ideological and political education can cover many fields, such as politics, culture, history, philosophy and so on. By guiding students to think deeply, it can improve students' logical thinking, practical ability, innovative consciousness and other aspects of quality. Therefore, the development of curriculum ideological and political education is the necessary guarantee to promote the comprehensive development of students, which is conducive to improving students' comprehensive quality and shaping social talents with good moral quality [5].

3.4. Developing ideological and political education is the key element of cultural infiltration in Mathematics Curriculum

As a scientific subject, mathematics has unique cultural connotation. Mathematics is not only a computing tool or method, but also a way of thinking and philosophical idea. The various concepts, theorems and formulas involved in mathematics reflect human understanding and exploration of the nature and laws of the world. The connotation of this thought and philosophy is exactly one of the important contents of widely publicizing and advocating the socialist core values. Secondly, the mathematics course guides students to think about social problems through case analysis. In mathematics courses, some practical cases or mathematical models can be used to help students think about social problems. For example, when learning statistics, students can be guided to explore social problems by analyzing the data of social phenomena; When learning functions, we can help students establish a correct outlook on life and values by discussing the donation in public welfare undertakings. Finally, mathematics education is also an important channel to cultivate students' innovative ability and practical ability [6]. As a basic subject, mathematics trains students' logical thinking and mathematical thinking ability. Through the study and practice of mathematics, students' innovative consciousness and practical application ability can be enhanced, so as to better contribute to the society and reflect the characteristics and advantages of national culture. Therefore, the development of curriculum ideological and political education is the key element of cultural infiltration in mathematics curriculum, which is conducive to the formation of mathematics education with national cultural characteristics.

4. STRATEGIES OF IMPLEMENTING IDEOLOGICAL AND POLITICAL EDUCATION IN MATHEMATICS TEACHING

4.1. Excavate the ideological and political elements of teaching materials and skillfully carry out subject education

Mining the meaning of Ideological and political elements in teaching materials refers to analyzing the teaching content, finding the ideological and moral, cultural, historical and other elements contained therein, guiding students to understand the ideological quality, values, social responsibility and other aspects, so as to achieve the goal of Ideological and political education in the course. By excavating the ideological and political elements of textbooks, students can deeply understand the ideological, cultural and historical origins behind mathematics knowledge, so as to enhance the depth of subject education. At the same time, mining the ideological and political elements of textbooks can also enable students to understand mathematics knowledge from multiple angles and enhance the breadth of subject education. Although mathematics is a natural science, it also has rich humanistic connotation. By excavating the ideological and political elements of textbooks, students can have a deeper understanding of the humanistic connotation of mathematical knowledge and cultivate students' humanistic spirit [7]. In short, mining the ideological and political elements of textbooks can make mathematics education more comprehensive, in-depth and meaningful, and enable students to acquire not only knowledge, but also humanistic spirit, ideological quality and social responsibility in the process of learning mathematics knowledge.

In the actual teaching, teachers should deeply analyze the teaching materials and find out the hidden ideological and political elements. For example, for mathematics textbooks, we can pay attention to fairness, justice and accuracy, and how to link these concepts with the real society. Teachers can also guide students to discuss the ideological and political issues involved in the course content. For example, when discussing the "optimal solution" in mathematics, teachers can guide students to think about how to make reasonable decisions and the values represented by the optimal solution. Taking "understanding time" as an example, teachers can carry out ideological and political education from the following aspects: historical concept: by introducing people's understanding and measurement of time in different times, guide students to understand the impact of various societies and cultures in history on the concept of time and calculation methods, and improve students' understanding of history and culture. Ethics: when explaining time management, guide students to reasonably arrange time, cherish time, develop good time concepts and time management habits, and cultivate students' self-discipline ability and sense of responsibility. Sense of social responsibility: through explaining the importance and role of time, guide students to realize the value and significance of time to society and individuals, and enhance students' sense of social responsibility. By skillfully carrying out the teaching of knowing time, students' Ideological and moral character and comprehensive quality can be cultivated at the same time of subject education.

4.2. Correctly using the ideological and political resources of Mathematics Course

First, based on the course content, analyze the ideological and political resources of the course from the perspective of mathematics. Different majors, the ideological and political resources of professional courses should be consistent with the attributes and characteristics of the major, so we should grasp the relationship between professional courses and ideological and political education. There are certain standards for the selection of moral education elements in the ideological and political education of mathematics major courses. We should appropriately

screen educational resources and screen resources in advance. Select the resources that are consistent with the cultivation of mathematical talents and the curriculum resources that can be used in the laws of mathematics [8].

Second, take students as the center and cultivate students' humanistic feelings. The use of Ideological and political resources in mathematics can effectively improve the level of mathematics professional knowledge, and make students further understand professional knowledge. When using the curriculum ideological and political resources, we should pay attention to students' interests and hobbies, so that students can tap more curriculum resources. Following the law of student development, the professional attributes of mathematics and liberal arts are different, the thinking modes of mathematics students and liberal arts students are also different, and the ideological and political elements are also different. Therefore, we should consider the characteristics of College Students' physical and mental development, meet the requirements of students' comprehensive development, and fully explore the ideological and political elements of different dimensions. Pay attention to students' actual life, choose the current political hot spots that students understand as the teaching material of Ideological and political course, and teachers analyze the key resource information from the professional perspective, so that students can establish the corresponding connection between knowledge and life, give play to the guiding significance of professional knowledge, and let students love and recognize their major [9].

Third, pay attention to the cultivation of students' personality innovation and development. In addition to finding and serving students in the course content, the curriculum ideological and political resources also need to pay attention to the characteristics of the curriculum ideological and political resources, and choose the best way to integrate. Because the curriculum ideological and political resources are relatively scattered, but the curriculum ideological and political resources have ideological and political functions. Teachers can integrate resources into all aspects of classroom teaching and serve as the carrier of education. In order to arrange and apply the scattered ideological and political resources in teaching, teachers should pay attention to the coordinated distribution of resources in the teaching process and play the endogenous role of Ideological and political resources [10].

4.3. Organize practical learning activities and infiltrate the concept of Ideological and Political Education

Organizing practical learning activities can help students better understand and apply the concept of Ideological and political education in practice, and improve the effectiveness of Ideological and political education. Mathematics teaching should not only pay attention to the teaching of theoretical knowledge, but also pay attention to the cultivation of practical ability. By organizing practical learning activities and letting students participate in mathematical application practice activities, not only can they improve their mathematical skills, but also can cultivate students' practical ability and innovative spirit. Mathematical practice activities are often closely related to the actual needs of society. By organizing practical learning activities, students can be guided to realize the impact of their work and behavior on society, and cultivate students' sense of social responsibility. In organizing practical learning activities, we can integrate ideological and political education elements, guide students to establish a correct world outlook, outlook on life and values, and strengthen students' Ideological and moral cultivation. For example, when designing practical projects, you can set topics with a sense of social responsibility, let students think about social issues in practice, and cultivate students' patriotism and civic awareness.

In practical application, the following practical activities can be designed: mathematical modeling practice: mathematical modeling practice is an activity that applies mathematical knowledge to practical problems, which can enable students to more deeply understand the application value of mathematical knowledge, and cultivate the spirit of innovation and exploration in practice [11].Mathematics competition activity: mathematics competition activity is an activity to improve students' mathematics level through the form of competition, which can make students feel the fun of mathematics, cultivate competition consciousness and self-confidence; Mathematical science and technology innovation practice: Mathematical Science and technology innovation practice is an activity to solve practical problems by using mathematical knowledge, which can make students feel the practicability of mathematical knowledge in practice, and cultivate the spirit of innovation and inquiry in practice; Mathematics community service practice: mathematics community service practice is an activity to serve the community by using mathematics knowledge, which can make students feel the social responsibility of mathematics knowledge, and cultivate teamwork and social responsibility in practice. Taking "Statistics" teaching as an example, students can choose a social problem, such as environmental pollution, education quality, etc., collect and analyze data through questionnaires, field visits and other methods, and use statistical methods to analyze, process and present the data. These practical learning activities can also enable students to have a deeper understanding of the application value and social responsibility of statistical knowledge, so as to enhance students' social responsibility and sense of responsibility.

4.4. Based on mathematics classroom teaching, carry out targeted ideological and Political Education

Based on mathematics classroom teaching means that in mathematics classroom teaching, students' ideological quality, values and social responsibility are targeted to carry out ideological and political education. Through the process of mathematics teaching, students are guided to establish a correct world outlook, outlook on life and values. When designing the teaching content, we should pay attention to the cultivation of students' Ideological Qualities and values such as inquiry spirit, innovation ability and team spirit, so that students can cultivate these abilities and qualities while learning mathematics knowledge. Teachers should also pay attention to guiding students to correctly handle the ethical, moral, legal and other aspects of mathematical problems. In mathematics classroom teaching, we can guide students to correctly deal with the ethical, moral, legal and other aspects of mathematical problems by explaining cases and problems, and cultivate students' Moral Cultivation and legal consciousness.

For example, in score teaching, we can strengthen students' theory and methods and improve their analysis and reasoning ability by explaining the concept and nature of score, demonstrating the equivalence relationship of score, and guiding students to carry out four operations of score. At the same time, with the help of computer software or online tools, students can experience the application and significance of mathematical knowledge in practical operation. In fraction operation, students need to take mathematics learning seriously, pay attention to the effect and quality of learning, and avoid problems such as calculation errors [12]. Teachers can guide students to take learning seriously, pay attention to the quality and effect of learning, and enhance students' sense of responsibility and sense of responsibility. The implementation of targeted ideological and political education needs to combine specific mathematical knowledge points and teaching contents, and cultivate students' innovative spirit, practical ability, moral cultivation and team spirit by guiding students' thinking, practice and exploration, so as to improve students' comprehensive quality and practical application ability.

4.5. Guide students' self reflection and enhance the value of Ideological and Political Education

Guiding students' self reflection is one of the important strategies for the implementation of Ideological and political education. It can help students think deeply about their thoughts, behaviors and values, so as to enhance the value of Ideological and political education. Through self reflection, students can have a deeper understanding of their strengths, weaknesses, strengths and weaknesses, and then understand their own characteristics and personality, so as to give better play to their strengths and overcome their shortcomings. Self reflection can also enable students to better understand their learning status and progress, so that they can effectively manage and adjust their learning, and improve their learning efficiency and results. In addition, through reflection, students can better find problems and challenges, think about ways and means to solve problems, so as to cultivate their critical thinking and innovation ability, and better adapt to the future social development.

The key to guiding students' self reflection and enhancing the value of Ideological and political education is to create a suitable learning environment. In the mathematics classroom, teachers should create a relaxed, harmonious and positive learning atmosphere, encourage students to freely express their views and give full play to their creativity, so as to stimulate students' self reflection consciousness. It is also necessary to design effective questions. Teachers should design enlightening and guiding questions according to the actual situation of students, so that students can think about their learning state, learning methods and learning goals through questions, so as to guide students to self reflect. The most important thing is to provide useful feedback [13]. Teachers should give targeted feedback to students in time, encourage students to give full play to their advantages, and point out what students need to improve, so as to help students better reflect on themselves and improve their learning level. Taking the teaching of "direction and position" as an example, students can summarize the basic concept, nature and application of direction and position through observation, experiment and exploration, and understand its importance in daily life and work. Or introduce some specific cases into classroom teaching, encourage students to analyze and discuss these cases, and give play to their thinking ability and innovation consciousness. For example, in the teaching of direction and location, cases such as how to determine the direction and distance between two places on the map, or how to use the direction sensor to determine the direction can be introduced. Through the guidance and encouragement of the above ways, students can think and reflect independently, and explore the thoughts, morality and values behind the knowledge itself. This helps to cultivate students' comprehensive quality, improve their sense of social responsibility and innovation ability, and is also conducive to the organic combination of mathematics education and ideological and political education.

5. CONCLUSION

With the development of the times, the goal of education is also changing. In addition to imparting knowledge, it is more necessary to cultivate students' comprehensive quality and ideological and moral character. As a basic subject, mathematics contains rich ideological and political education elements in teaching, such as rational thinking, innovative spirit,

moral sentiment and so on. The value of curriculum ideological and political ideas in mathematics classroom teaching is mainly reflected in: on the one hand, it can enhance students' patriotic feelings and cultural confidence, on the other hand, it can promote students' comprehensive quality improvement and personality shaping. Guiding students to think and apply knowledge through mathematics teaching can not only help them lay a solid foundation in mathematics, but also enable them to have a more positive attitude towards life and values. Therefore, it is very necessary and important to combine the ideological and political ideas of the course with mathematics teaching.

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REFERENCES

[1] Cheng G, Li. C, Liu Y. Y, Exploration and practice of the implementation path of integrating college mathematics curriculum into curriculum ideological and political education. Gansu Education Research, 2023, 24 (4): 117-119.

[2] Cheng D. S, Ning L. H, The view of knowledge from fragmentation to pluralistic integration: the practical logic of Ideological and political education in mathematics. Research on the development of vocational education, 2023, 16 (1): 84-92.

[3] Cao Y, Design of Mathematical Culture Course under the background of Ideological and political education. Journal of Tianjin Vocational College, 2021, 23 (11): 22-25.

[4] Chen H, Exploration and practice of Ideological and political education in mathematics. China University teaching, 2020, 363 (11): 44-49.

[5] Deng H. X, Wu L. B, Exploration on the path of Integrating Ideological and political education into mathematics education. Education Science Forum, 2020, 520 (34): 50-53.

[6] Li H, Practice of integrating "curriculum ideological and political education" into higher vocational mathematics classroom. Journal of Changjiang Institute of engineering technology, 2021, 38 (4): 36-39.

[7] Ma J. P, Ideological and political construction and teaching practice of higher mathematics. Journal of Qinghai Normal University (NATURAL SCIENCE EDITION), 2021, 37 (4): 87-91.

[8] Peng S. J, Xu Z. T, Classroom teaching realization of Ideological and political education in College Mathematics. China University teaching, 2020, 364 (12): 27-30.

[9] Wang L. J, Zhang W. Z, Ideological and political construction of mathematics curriculum based on mathematical history and culture. Journal of Huzhou Normal University, 2022, 44 (10): 112-116.

[10] Xuan Z. X, Lu X. L, Yuan, A. F, The construction and practice of the ideological and political group of College Mathematics public basic course. College mathematics, 2022, 38 (6): 45-52.

[11] Yan Y. F, Thinking and Exploration on the construction of the ideological and political system of mathematics courses in Colleges and universities. Journal of Jiangsu Institute of economics and trade, 2023, 166 (2): 80-83.

[12] Zhu Y. T, Wu. Q. M, Classification and implementation path of Ideological and political elements of "higher mathematics" course. Journal of higher education research, 2022, 45 (4): 88-93.

[13] Zhang H. F, Zhu C. L, Zhao J, Research on the organic integration of higher mathematics and curriculum ideological and political education . Journal of Hunan Post and Telecommunications vocational and technical college, 2021, 20 (4): 65-68.

The Impact of Artificial Intelligence on the Teaching Work of University Teachers and Countermeasures

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Abstract: The changes in talent demand in the era of artificial intelligence include: innovative and composite talents becoming the "new darling", a surge in demand for human-machine collaborative talents, and self-learning and lifelong learning as essential characteristics of talents. These changes put higher demands on the talent cultivation work of universities and further affect the teaching work of university teachers, mainly in the aspects of teaching space extension, diversification of teaching resources, transformation of subject roles, and integration of artificial intelligence technology with teaching processes. In order to improve the quality of talent cultivation and teaching work in universities, university teachers should timely improve their knowledge structure to meet the learning needs of students; enhance their information literacy and make rational use of online teaching resources; timely change their roles to promote student development; and proficiently use artificial intelligence technology to innovate teaching methods.
Keywords: Artificial intelligence; Talent demand; Teaching work; Countermeasures

1. INTRODUCTION

Artificial intelligence (AI) is a new technology science that studies the use of computers to simulate human learning, reasoning, thinking, planning, and other behaviors [1]. AI technology is widely used in machine recognition, automatic planning, intelligent control [2], genetic programming, and other fields, becoming the core driving force for a new round of scientific and technological revolution and industrial structure upgrading [3]. The demand for talents in the AI era has changed, and new requirements have been put forward for talent cultivation in universities. Teachers are the cornerstone of talent cultivation in universities, and their teaching level is directly related to the quality of talent cultivation. Based on the changes in the demand for talents in the AI era, this paper analyzes the impact of AI on the teaching work of university teachers, and explores specific strategies for university teachers to cope with the challenges of AI and improve teaching work from the aspects of integration of online teaching resources, application of educational technology, and innovation of teaching methods [4].

2. CHANGES IN TALENT DEMAND IN THE AGE OF ARTIFICIAL INTELLIGENCE

Currently, artificial intelligence technology has permeated every aspect of politics, economy, education, healthcare, and home life, comprehensively propelling human society into the era of artificial intelligence and profoundly affecting the demand for talents. The most prominent change is the increased demand for innovative, composite, and human-machine collaborative talents, while requiring talents to possess the ability to learn independently and for life. These changes have further transmitted to the level of talent cultivation and teaching in universities, urgently demanding that universities strengthen talent cultivation work and require teachers to improve teaching methods and enhance teaching quality.

2.1 Innovative and composite talents become the "new favorites"

In the era of artificial intelligence, information systems are integrated with the economic and natural systems of human social development, and social resources are networked, digitized, and intelligent. From a macro perspective, data, knowledge, and innovation have become the core elements of economic development, and various industries urgently need a large number of innovative talents. From a micro perspective, innovation has become the core driving force for enterprises to maintain competitiveness and achieve sustainable development. Enterprises not only focus on the innovation ability and job skills of talents, but also on their abilities in teamwork, interpersonal communication, emotional management, stress relief, problem analysis, and other aspects. If individuals only master a single skill and companies rely solely on a certain type of talent, they cannot maintain long-term competitiveness in the environment of artificial intelligence technology.

2.2 Surge in demand for human-machine collaborative talents

Artificial intelligence technology relies on computers, and the intelligent transformation has brought about a disruptive change in the way social production operates. On the one hand, traditional, repetitive labor

is gradually replaced by robots; on the other hand, a large number of new decision-making and flexible positions or occupations are constantly emerging in the talent market. Most of these new positions or occupations require the use of computers to complete daily work, so human-machine collaboration has become the mainstream mode of production and service. This requires talents to be proficient in the mode of production and operation of human-machine collaboration, that is, to be proficient in the application of artificial intelligence theory and methods in different scenarios of relevant positions, and the software operation of artificial intelligence systems.

2.3 Independent learning and lifelong learning are essential characteristics of talents

With the continuous innovation and development of artificial intelligence technology, the breadth of knowledge is constantly expanding and the speed of updates is accelerating. Matter, space-time, and resources are no longer constraints for knowledge learning, and people's employment patterns also exhibit diversified characteristics. For talents to maintain their competitiveness, they must persist in learning, possess strong autonomous learning and lifelong learning abilities, constantly update their knowledge structure, and master new skills to adapt to changes in talent demand.

Overall, in the era of artificial intelligence, society requires a large number of innovative and composite talents, which also requires talents to possess innovative consciousness, human-machine collaboration skills, and the ability to learn independently and lifelong learning, among others [5]. Universities are the main front for cultivating high-level talents, and the changes in talent demand in the era of artificial intelligence urgently require universities to adjust their talent cultivation work in a timely manner. The current higher education system originated from the industrialization era and has been nearly perfected. If the cultivation mode based on teachers imparting inherent knowledge and students passively receiving knowledge is still adopted, and only the cultivation and training of talents' professional skills are emphasized, it will be difficult to adapt to the requirements of cultivating composite talents in the era of artificial intelligence [6]. In addition, teachers are one of the core elements of the university education system and the main transmitters of knowledge and skills. Teaching work is the "motive force" for the innovation of talent cultivation mode in universities, and the impact of artificial intelligence on the talent cultivation work in universities is first reflected in the impact on teachers' teaching work [7].

3. THE IMPACT OF ARTIFICIAL INTELLIGENCE ON THE TEACHING WORK OF UNIVERSITY TEACHERS

Artificial intelligence has caused changes in the demand for personnel in various fields of society, and employers have put forward higher requirements for the quality and skills of talents. Teachers are the key to the implementation of talent training tasks in colleges and universities, and they play a pivotal role in the higher education system. At present, the direct impact of artificial intelligence on the teaching work of college teachers is mainly reflected in four aspects.

3.1 Independent learning and lifelong learning are essential characteristics of talents

One of the changes in teaching brought about by the application of artificial intelligence in the field of education is the rise of online teaching and network teaching models. The rise of network teaching models has broken the traditional situation of taking the classroom as the only classroom teaching position. Network classes provide students with flexible learning methods, enrich learning resources, broaden learning channels, and are conducive to cultivating students' autonomous learning and innovation capabilities [8]. At the same time, network courses, as derivatives of offline courses, have the characteristics of simple production, low cost, high income, easy dissemination, and personalization, which can meet the personalized learning needs of different students. Therefore, in recent years, buffet-style online classes have become the mainstream trend of students' autonomous learning. Of course, the change of learning methods also puts forward new requirements for teachers' knowledge structure. How to transform professional knowledge from offline resources to online resources? How to make boring textbook knowledge vivid and interesting? These require teachers to constantly improve their knowledge structure while deeply understanding and mastering professional knowledge and professional skills, so as to meet the new needs of students' learning.

3.2 The diversification of teaching resources has raised higher requirements for teachers' information literacy level

Although the application of artificial intelligence has greatly enriched online teaching resources and facilitated students' access to them to a large extent, it must be noted that the various resources on the Internet are mixed and uneven, and excessive unordered cognition and fragmented information can lead to deviations in students' understanding of knowledge. At the same time, the current theoretical system of online education is still imperfect, and students are prone to getting lost in a sea of even partially contradictory knowledge information. Online teaching mode requires

Teachers should improve their information literacy and play a leading role in classroom teaching. On the one hand, teachers should possess rich professional knowledge, strong critical thinking ability, and information processing ability, and be able to discover and select appropriate learning resources from a vast and fragmented teaching resource environment. On

the other hand, when using online teaching resources, teachers should be able to systematically, structurally, and professionally organize and integrate teaching resources.

3.3 The transformation of the main role requires teachers to establish a teaching philosophy of guidance and cooperation

In the traditional teaching model, teachers are the transmitters of knowledge and the authority of the classroom. They dominate the classroom and guide students' learning by imparting knowledge and skills; students are the objects of knowledge infusion and passive receivers. However, with the deep application of artificial intelligence technology in the field of education, the traditional role of teachers is increasingly insufficient to meet the needs of online teaching models. In the context of the era of artificial intelligence, students play a more active role and are the main body of autonomous learning. They actively participate in the learning process, actively explore, think, and practice, and construct a knowledge system through active questioning, cooperative learning, and independent research, actively cultivating critical thinking, problem-solving ability, and innovation ability. However, from the current point of view, the lack of information literacy, online learning ability, and critical thinking ability is the shortcoming of students in the era of artificial intelligence [9]. This requires teachers to change their teaching concepts, highlight their guiding role in teaching, play the role of a guide for students' learning and career development, and become a guide and partner for students. On the one hand, actively guide students to actively explore and construct a knowledge system, encourage students to think independently, raise questions, solve problems, and cultivate their creativity and critical thinking ability; on the other hand, provide personalized learning guidance to students and fully tap their potential and strengths.

3.4 Artificial intelligence technology has been preliminarily integrated into the teaching process, requiring teachers to innovate teaching methods

The integration of artificial intelligence technology with the teaching process is a concrete manifestation of the deep integration of artificial intelligence into the field of education, which has had a profound impact on teachers' teaching work. Currently, the application of artificial intelligence technology in the field of education is still in its initial stage, and the integration of artificial intelligence technology with the teaching process is still relatively superficial. Specifically, firstly, most universities only use artificial intelligence technology in the whole process of a few demonstration courses; secondly, most courses that integrate artificial intelligence technology mostly use it in the pre-class sign-in, facial recognition, and post-class expansion resource self-learning stages, while traditional teaching methods are still used in classroom teaching; thirdly, the deep integration of artificial intelligence requires perfect hardware and software systems, but some universities lack funds and other reasons, resulting in inadequate hardware.

The transformation of software systems has not yet been completed [10]. It can be seen that the integration of artificial intelligence technology and teaching process is still in its initial stage, and the deep integration of the two is still a long way to go. As practitioners of teaching activities, teachers' use of artificial intelligence technology for teaching reform is also in its initial stage. Teachers need to explore deeply, master new teaching models, and constantly innovate teaching methods.

4. TEACHING STRATEGIES FOR COLLEGE TEACHERS

In the era of artificial intelligence, teaching in universities faces new challenges and changes. Teachers should promptly improve their knowledge structure to meet the new learning needs of students, enhance their information literacy, and make rational use of online teaching resources. They should also timely transform their roles to promote student development and proficiently use artificial intelligence technology to innovate teaching methods.

4.1 Improve the knowledge structure in time to meet the new learning needs of students

Currently, the teaching space extends from offline classrooms to online virtual spaces, and the field of knowledge dissemination has changed. Teachers must fully understand the characteristics of Internet plus, such as the wide range of information sources, fast retrieval, transmission, and sharing, and diversity of display methods. They should master the Internet teaching mode, strengthen learning, enrich their subject expertise, and improve their theoretical level of education and teaching. At the same time, they should understand the learning characteristics and needs of post-2000 students, continuously improve their literacy, establish authority among students with rich knowledge, and further lead students in pursuing new knowledge.

4.2 Improve information literacy and make rational use of online teaching resources

Teachers should enhance their information literacy from four aspects: information technology cognitive ability, information technology application ability, information acquisition ability, and Internet lifelong learning ability. Firstly, fully respect and recognize new technologies, and continuously learn new technologies, thereby enhancing information technology cognitive ability. Secondly, use artificial intelligence technology as a powerful assistant in teaching, carry out personalized and adaptive teaching, and guide students to participate in experiential activities in virtual reality simulation scenarios, thereby improving information technology application ability. Thirdly, proficiently master and use search engines for information analysis and processing,

continuously enhancing information acquisition ability. Finally, cultivate lifelong learning ability, continuously improve information literacy, and cope with the iterative updates of knowledge and technology. At the same time, in response to students' problems such as lack of information literacy, insufficient online learning ability, and poor critical thinking ability, teachers need to systematically, structurally, and professionally help students organize and integrate online resources, and reasonably use online teaching resources to help students formulate sound learning plans and appropriate study plans.

4.3 Promote student development by timely changing roles

In teaching, the teacher's role is no longer an absolute "dominator" but an "assistant" who helps students learn and a "learner" who explores with students; nor is it the only "source of information" but a "platform of information" that meets the needs of students. Firstly, teachers should be adept at guiding students to independently explore knowledge in the classroom, transforming students from passive recipients to active participants and dynamic practitioners, making them the "leading role" in learning. Secondly, teachers should be willing to act as an "assistant", enter the classroom with a "low profile", and do more auxiliary work for students' learning, enhancing the status of students' learning. Thirdly, teachers should be happy to be a "beneficial friend" of students, encouraging students to ask questions, guiding students to discover problems, and guiding students to solve problems, with appropriate guidance only at critical moments, in order to enhance students' thinking ability.

4.4 Skilled use of artificial intelligence technology and innovative teaching methods

On the one hand, teachers should be proficient in various artificial intelligence technologies, such as using digital technology to process teaching resources into graphics, images, animations, digital videos, digital audios, virtual reality teaching courseware, etc., and processing and integrating them through artificial intelligence technology to make teaching resources rich and diverse in form, so as to help students better understand abstract concepts and processes, and meet the personalized needs of students to the greatest extent, achieving personalized learning experience. On the other hand, teachers should constantly innovate teaching methods, apply information technology to the process of teaching practice, change traditional teaching methods, enhance the interest of teaching content and methods, constantly innovate teaching methods, and stimulate students' learning initiative. For example: using artificial intelligence technology such as images, animations, videos, and audios to continuously improve students' visual thinking, creating dynamic environments to help students understand knowledge rules, creating virtual reality scenarios to stimulate students' interest in learning, strengthening interactive communication, and stimulating students' subjective initiative.

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REFERENCES

[1] Zhu Yanjun, Guo Jing. Construction of the index system for the academic development of university teachers' teaching - based on the Delphi method. Higher Education Exploration, 2019(3): 110-117

[2] Zhu Heling, Hao Xiaojing. Cultivating Compound Talents in the Context of New Liberal Arts Construction: New Changes, New Challenges, and New Ideas. Higher Education Exploration, 2023(4): 20-25

[3] Huang Liwen, Wang Jian. On the Transformation and Innovation of Vocational Education in the Age of Artificial Intelligence. Nanjing Social Sciences, 2020(10): 142-148

[4] Huang Jiping, Wang Yuheng, Pan Xiaoying, et al. Research on innovative paths of classroom teaching for cultivating independent learning abilities of higher vocational students. Educational Research, 2021(2): 140-141

[5] Wang Xuenan, Lin Zhong, Zhu Hui. Robot Education and Talent Cultivation Based on Scientific Literacy - An Interview with Academician Zhang Bo, Dean of the Artificial Intelligence Research Institute of Tsinghua University. China Educational Technology, 2019(6): 1-5

[6] Zhao Lihong, Zuo Min, Huang Xiankai. The transformation direction of higher education teaching in the era of artificial intelligence: cultivating higher-order thinking. Journal of Beijing Normal University (Social Sciences Edition), 2023(4): 40-48

[7] Li Zhihe, Zhou Nana, Qin Yifan, et al. Construction of Activity Mechanism for Blended Learning Community in Online Learning Space. China Educational Technology, 2019(9): 104-111

[8] Luo Yangyang, Han Xibin. Research on the classification of blended courses based on students' online learning behavior characteristics. China Educational Technology, 2021(6): 23-30, 48

[9] Zhang Qinggen, Tang Huanli. Course learning and the enhancement of critical thinking ability of undergraduates: an analysis based on the data of the "National Undergraduate Ability Tracking Survey" from 2016 to 2019. Higher Education Research, 2021(8): 79-88

[10] Wang Xue, He Haiyan, Li Ping, et al. Research on the cultivation of artificial intelligence talents: review, comparison and prospect. Higher Engineering Education Research, 2020(1): 4

Research on the Construction and Learning System of Poetry Reading and Recitation Database

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Abstract: This article collected 20 videos, audio recordings, voice EGG, and chest and abdominal breathing signals of poetry reading and recitation from 5 speakers. At the same time, a reading and recitation database was established, and speech analysis software was developed. Experimental phonetics techniques and linguistic theory methods were used to study reading and recitation, summarize recitation methods, and establish a learning software for poetry reading and recitation, in order to better learn poetry and inherit traditional Chinese culture. The research in this article indicates that the rhythm and melody changes of poetry reading and recitation are related to the level, tone, and meter patterns. The differences between reading and recitation of five character and seven character modern poetry mainly lie in the division of rhythm and the alternation of length and tempo, as well as the dragging of the end of the sentence during recitation. The steps formed by pauses are the foundation of rhythm, and they are the smallest and fundamental unit of rhythm. Modern style poetry with consistent levels, tones, and meter patterns can have the same melodic pattern recited, which means that the same method can be used to recite modern style poetry with the same sentence structure. Reciting similar types of modern poetry has similar melodies and completely consistent rhythms.
Keywords: Poetry reading; Poetry recitation; Speech analysis; Phonetic feature; Poetry database

1. INTRODUCTION

Learning poetry is an important aspect of studying excellent traditional Chinese culture. Reading aloud is a common method of learning poetry in contemporary times, while recitation is a traditional method of learning poetry. Recitation is a classical poetry recitation method that falls between "singing" and "reading", characterized by a rhythmic and unique melodic tone. Reciting is not only an important way to appreciate poetry, but also an important means of creating poetry, and it is now a national intangible cultural heritage.

Recitation is a traditional method of reciting classical poetry, and research on recitation mainly focuses on linguistic and musical perspectives. Scholars such as Wang Enbao, Chen Shaosong, Qin Dexiang, and Xu Jianshun have conducted in-depth research on recitation from a literary perspective, summarizing the recitation methods and characteristics of recitation tones in ancient poetry, prose, and other literary genres [1-3]. Ye Jiaying believes that the ability to recite is one of the important characteristics of classical Chinese poetry, and recitation is also an important method for us to study the beauty of ancient Chinese culture [4]. Zhao Minli believes that the tone of recitation is determined by the phonetics, tones, and tones of Chinese characters, and that traditional recitation is essentially an art of language [5]. Xu Jianshun elaborated on the methods of recitation in detail from six aspects: "flat long and narrow short", "following the lines of characters", "literary reading and pronunciation", and "vocal techniques"[6]. Yang Feng analyzed over a hundred recitation works from a linguistic theoretical perspective using experimental phonetics research methods, and studied the recitation characteristics and methods of modern poetry, ci, and ancient texts [7].

The purpose of this study is to establish a database for poetry reading and recitation, compare the similarities and differences between reading and recitation through speech analysis, summarize recitation methods, and design poetry recitation learning software.

2. SIGNAL ACQUISITION

This article collects 20 poems recited by 5 speakers, 15 modern style poems, and 5 words. Each poem is read aloud in Mandarin and recited again. The speaker speaks standard, clear, and emotional Mandarin.

Using devices such as cameras, microphones, mixing consoles, and electronic glottometers (EGGs), synchronize the recording of two signals, with the first recording voice signals and the second recording EGG voice signals. After the recording is completed, the data is sorted and edited, and each ancient poem is recited and saved as a file. Each file has two channels, with the left channel being the voice signal and the right channel being the EGG voice signal.

3. DATABASE DESIGN FRAMEWORK

Editing, organizing, and annotating the poetry reading and recitation data of 5 recorded speakers,

labeling the speech signals with syllables and steps, calculating parameters such as syllable duration, step duration, and pause duration, and outputting the parameters to an Excel spreadsheet for statistical analysis. Extract fundamental frequency parameters from voice signals, smooth and normalize them, and output them to an Excel spreadsheet. As shown in Figure 1, a poetry reading and recitation database is established based on the extracted acoustic parameters, audio and video data [7-10].

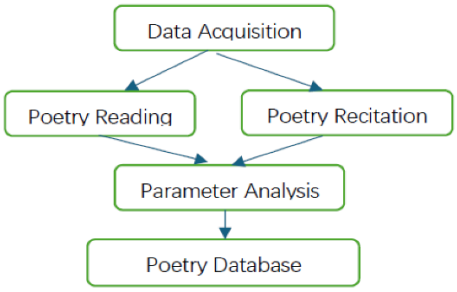

Figure 1 Framework of poetry reading and recitation database

4. DATA ANALYSIS SYSTEM

To analyze the data of poetry reading and recitation, computer software was designed to synchronously analyze four signals: speech, voice, chest breathing, and abdominal breathing. Mark the prosodic hierarchy, extract parameters such as duration, fundamental frequency, amplitude, and prosodic boundary duration of prosodic units such as syllables, steps, prosodic phrases, and prosodic sentences, and output them to an Excel spreadsheet. Output the normalized fundamental frequency, open quotient, and velocity quotient parameters of each syllable to an Excel spreadsheet, and also output the original fundamental frequency, open quotient, and velocity quotient parameters of the entire poem or a certain vocal signal. Mark the start and end time points of inhalation, exhalation, and calculate the reset amplitude, duration, slope, area, and other parameters of the inhalation and exhalation phases of chest and abdominal breathing, and output them to Excel. Analyze respiratory characteristics, vocal patterns, and rhythmic hierarchy patterns, as well as their relationships. It can also be used in fields such as speech engineering, music, and language teaching to synchronously analyze speech acoustic signals, voice signals, and chest and abdominal respiratory signals such as reading, recitation, and singing, and extract various parameters for statistical analysis. This system is written in Matlab environment and adopts a code based GUI framework structure, which has the characteristics of concise code and easy control.

The system operation interface consists of five areas: menu operation area, signal, parameter, and marker display area, prompt parameter display area, which displays information such as the file name, syllable count, prosodic sentence count, and respiratory reset count of the currently processed file. The interface display control area controls the display time scale, display accuracy, and selection of displayed curves. The prosodic and respiratory marker areas are also included. Read in the original file and edit, denoise, amplify, and replace the speech, voice, and chest and abdominal breathing signals. You can choose to save or save them as *. wav format files. The sampling rate, number of channels, and order are consistent with the original file. The extracted parameters such as speech amplitude, fundamental frequency, open quotient, velocity quotient, prosodic level markers, and breath reset are stored in *. mat format files on the Matlab platform. The rhythm marker display area is used for rhythm level annotation. First, select "Start Marking", then use the left and right mouse buttons to select a certain speech signal, and then click "Syllable" or other buttons to display the rhythm marker lines. To delete rhythm markers, first select the line to be deleted with the mouse and click the corresponding "delet" button to delete it.

Read in the original file and edit, denoise, amplify, and replace the speech, voice, and chest and abdominal breathing signals. You can choose to save or save them as *. wav format files. The sampling rate, number of channels, and order are consistent with the original file. The first prosodic unit duration intensity parameter library has a file name naming rule of Prosody + the file name of the currently opened wav file. The data includes text man, tone, tone value, syllable duration, syllable pause duration, prosodic word duration, prosodic word pause duration, prosodic phrase duration, prosodic phrase pause duration, prosodic sentence duration, prosodic sentence pause duration, paragraph duration, paragraph pause duration, etc. The second one is the voice parameter database, which mainly includes parameters such as fundamental frequency, frequency quotient, and speed quotient. The file name naming rule is EGG + the file name of the currently opened WAV file. The system uses a combination of manual annotation and automatic detection algorithm for detecting respiratory reset points. First, click on the approximate location of the respiratory reset point with the mouse, and then the system automatically detects the position of the maximum respiratory reset point within the 0.1 second cursor area. The amplitude value and time point of the respiratory reset are automatically saved. The purpose of manual operation is to select and judge the respiratory reset point based on linguistic theory, while the purpose of automatic operation is to more accurately detect the location of the respiratory reset point and avoid errors in manual operation.

5. LEARNING SYSTEM DESIGN

In order to learn poetry reading and recitation, we have designed a poetry reading and recitation learning software. As shown in Figure 2, learners can learn to read or recite poetry, play a certain poem,

imitate and train by following along, and mark the Chinese Pinyin. Learners can follow and imitate sentence by sentence, mastering the rhythm and melody changes of recitation.

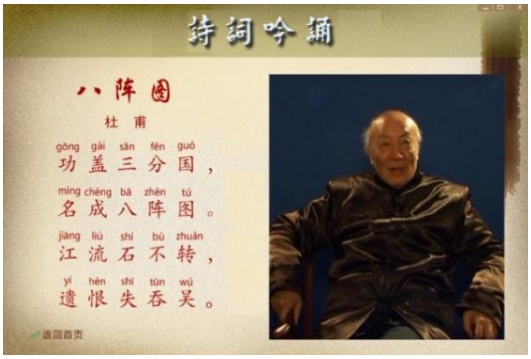

Figure 2 Poetry reading and recitation learning software

6. CONCLUSION

Starting from the concept of multimodal speech, this article collects videos, speech, voice EGG, and chest and abdominal breathing signals of poetry reading and recitation. At the same time, a reading and recitation database is established, and speech analysis software is developed. Experimental phonetics and linguistic theory methods are used to study reading and recitation, summarize recitation methods, and establish a learning software for poetry reading and recitation, in order to better learn poetry and inherit traditional Chinese culture.

Establish a poetry and speech prosody analysis system, add prosodic levels and breath reset markers to the signal, extract parameters such as duration, amplitude, and boundary duration of each prosodic unit, fundamental frequency, open quotient, and velocity quotient of the voice signal, reset amplitude, duration, slope, and area of chest and abdominal breathing, and analyze the differences in prosody between reciting and reading ancient poetry and literature.

This article mainly studies the differences between the reading and recitation of 57 character modern style poetry from the perspectives of rhythm, prosodic hierarchy, melody, vocalization, and breathing, and summarizes the methods of recitation. Firstly, analyze the basic rhythm and rhythmic hierarchy of classical poetry. Then compare the differences in rhythm levels between the reading and recitation of 57 character modern style poetry, analyze the relationship between steps and rhythm, as well as the combination of tone and melody, and summarize the methods of recitation of 57 character modern style poetry.

Modern style poetry has strict rules of tone and scale, fixed word count and sentence count, and emphasizes rhyme and parallelism. Quatrains and regulated poems are both composed of four basic tonal patterns. Therefore, studying the recitation of modern poetry makes it easier to discover the corresponding relationship between the alternation of tones and the changes in recitation melody and rhythm. At the same time, comparing recitation in different dialect regions also makes it easier to identify the differences in rhythm and melody. The main differences between reading and reciting five character and seven character modern poetry lie in the division of rhythm and cadence, the alternation of length, and the dragging of the end of the sentence during recitation. The steps formed by pauses are the foundation of rhythm, and they are the smallest and fundamental unit of rhythm. Modern style poetry with consistent levels, tones, and meter patterns can have the same melodic pattern recited, which means that the same method can be used to recite modern style poetry with the same sentence structure. Reciting similar types of modern poetry has similar melodies and completely consistent rhythms.

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REFERENCE

[1] Wang Enbao and Shi Peiwen: "Collection of Recitation of Ancient Poetry and Literature", Beijing: Beijing Language and Culture University Press, 1993.

[2] Chen Shaosong: "Recitation of Ancient Poetry and Literature", Beijing: Social Sciences Literature Press, 2002.

[3] Qin Dexiang: "Reciting Music", Beijing: China Federation of Literary and Art Circles Press, 2002.

[4] Ye Jiaying: "On the Aesthetic Characteristics of Chinese Old Poetry and the Tradition of Recitation", Literature and Culture, 2012, Issue 2, Page 4.

[5] Zhao Minli: "On the Linguistic Characteristics of Traditional Recitation", Journal of Capital Normal University (Social Sciences Edition), 2013, Issue 6, p. 93.

[6] Xu Jianshun: "On the Basic Methods of Recitation", "Reciting Classics, Loving China - Collection of Essays from the Chinese Recitation Week", 2009.

[7] Yang Feng: "Research on Traditional Chinese Recitation: From the Perspectives of Rhythm, Voice, and Breathing", Beijing: PhD Dissertation, Peking University, June 2012.

[8] Liberman, P. 1967. Intonation, Perception, and Language. Cambridge, Massachusettes: The MIT Press.

[9] Ohala, J. J. 1990. Respiratory activity in speech. In Speech Production and Speech Modelling, ed. W. J. Hardcastle, A. Marchal, 23-53. Dordrecht: Kluwer Academic Publishers.

[10] Shi, Feng, Jinyu Zhang, Xuejun Bai, and Zhaohong Zhu. 2010. Intonation and Respiration: a Preliminary Analysis. Journal of Chinese Linguistics 38(2): 323-335.