

A Study on the Teaching Design of Finals ‘u’ and ‘ü’ in the Context of ChatGPT Application with Human-Computer Collaboration

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Abstract

This paper provides an in-depth analysis of the strengths and weaknesses of the ChatGPT-generated lesson plans for Finals ‘u’ and ‘ü’, and puts forward corresponding optimisation suggestions. The lesson plans have potential in terms of structure, teaching methods, and content, but there are problems of linguistic background adaptation, lack of diverse learning styles, insufficient use of modern educational technology, and insufficient systematic assessment and feedback, and so on. To compensate for these shortcomings, teachers need to combine their cognitive strengths with teaching strategies that accommodate language differences, activity design that supports diverse learning styles, integration of modern educational technology, and the establishment of systematic assessment and feedback mechanisms. Teachers will be able to provide students with more comprehensive, effective and personalised teaching of Chinese rhymes to help them overcome pronunciation difficulties, improve their Chinese language proficiency and stimulate their enthusiasm for learning Chinese. In addition, through these improvements, teachers will be able to better understand and respond to the specific needs of their students, and to promote the development of students' language skills and cultural understanding in the context of globalisation. This not only enables students to communicate more effectively in a multilingual environment, but also provides valuable insights and strategies for the promotion and practice of international Chinese language education.

Chapter One: Introduction

At present, academics have explored the design of international Chinese Finals instruction from multiple perspectives and achieved fruitful results. Jinlong Cheng(2014), in response to the bias produced by Korean students when learning Chinese sound and rhyme, adopts teaching methods such as demonstration method, demonstration method, comparison method, analogy method, and shunlian method, combines phonological teaching with speech flow teaching, and develops targeted

teaching strategies, and this method can better solve the pronunciation problems encountered by the students in the actual language environment, and improve their language fluency and accuracy; Mingming Wang(2023) designed the teaching and learning of the combined oral call rhymes for Indonesian students at the primary level, and this targeted teaching design helps to solve the specific difficulties encountered by students in the learning process, thus improving the personalisation and effectiveness of teaching; these studies have pioneered in the field of teaching and learning of the Chinese rhymes ‘u’ and ‘ü’, which are the most common in the Chinese language. teaching field has created a new exploration path, and laid a solid foundation for the deepening and expansion of educational theories. It provides valuable empirical support for international Chinese education theories, enriches educational practices, promotes the innovation of teaching methods, and makes important contributions to the optimisation and innovation of global Chinese teaching practices. By testing the effectiveness of these methods in actual teaching, educators not only improve the quality of teaching, but also add impetus to the promotion and development of international Chinese language education, which is of great significance in improving the status of Chinese language teaching and cultural influence in the world, and deepening international cultural exchange and understanding.

ChatGPT-Plu (GPT-4), with its powerful natural language comprehension and generation capabilities, brings opportunities and challenges to the international Chinese education cause and the development of the discipline. Scholars such as Shi Feng (2023) have argued that ChatGPT suffers from non-embodied features and lack of cognitive motivation, which may limit the relevance, effectiveness and implementation of the instructional design it generates. Academics have adopted the human-computer collaborative approach to instructional design practice, with research focussing on novels and Chinese character teaching, and the main theory of research is the ‘expression-driven’ theory. Chen Keyu (2023) used novel writing as an example to discuss the ability of the GPT-4 in assistive orientation and its efficacy and effectiveness in novel writing. Yanni Guo et al. (2024) design practice for teaching Chinese characters through human-computer collaboration. Jiantao Li et al. (2023) selected two applications, SecondLife and ChatGPT-4, as the target tools to explore the specific instructional design of ‘expression-driven’ teaching theory.

Currently, based on the application of ChatGPT, human-computer collaboration in the study of Chinese rhymes is still in the preliminary stage of exploration, but it has begun to show its potential and possibility. This study makes full use of the powerful data processing and pattern recognition capabilities of ChatGPT to try to innovate the instructional design of Chinese rhymes ‘u’ and ‘ü’. The results of this study are expected to provide valuable references for the reform of the international Chinese language education industry, especially in the design of customised instructional content for students with different native language backgrounds, which can be greatly improved by using AI technology. In conclusion, although the application of human-computer collaboration in the field of Chinese rhymes teaching is still in its infancy, it has already shown great potential for development and future value. With the further maturation of the technology and the deepening of the educational practice, it is

expected that in the future, this new type of teaching mode will play a more and more important role in the field of global Chinese language teaching, and the results of this study are expected to provide valuable references for the reform of the international Chinese language education industry. The results of this study are expected to provide a valuable reference for the reform of the international Chinese language education industry.

Chapter Two: ChatGPT Technology-Assisted Teaching Design of Rhymes ‘u’ and ‘ü’

ChatGPT is a conversational bot developed by OpenAI, an AI research institute in the U.S. The use of ChatGPT in instructional design has revolutionized the field of education in many ways, significantly improving teaching efficiency and student motivation to learn. As an advanced conversational AI, ChatGPT is able to provide personalized learning assistance to students, providing customized explanations and exercises based on their learning history and preferences by providing customised explanations and exercises. It also automatically generates course materials and exercises to reduce teachers' workload and updates the content in real time to keep it modern and relevant. In addition, ChatGPT supports real-time Q&A and feedback to enhance student engagement and classroom interaction; is able to simulate different teaching scenarios to help students practice their communication skills through role-playing; and provides uninterrupted academic support for distance education to ensure wide accessibility and inclusiveness of educational resources. Through these features, ChatGPT not only makes education more personalised and interactive, but also provides teachers and students with the tools to teach and learn more effectively in a wide range of educational environments, driving traditional education towards a smarter and more responsive future. We can use ChatGPT to assist the teaching design to teach the rhymes ‘u’ ‘ü’ in Lesson 1 Hello vs NǐHǎo, the first lesson of TangFeng Chinese ‘Tang1’ for Pakistani Chinese learners at the elementary level. The teaching content includes students being able to identify and differentiate the rhymes ‘u’ and ‘ü’; and being able to accurately pronounce and apply these two sounds in real-life dialogues. After determining the starting state, input the instruction to ChatGPT: Please design a lesson plan for Pakistani learners of Chinese at the elementary level, with the following objectives: students can identify and differentiate the rhymes ‘u’ and ‘ü’; students can accurately pronounce and apply these two sounds in The objectives of the lesson plan are: students can identify and differentiate between the rhymes ‘u’ and ‘ü’; students can pronounce the sounds accurately and apply them in real-life dialogue.

ChatGPT quickly generates a basic lesson plan based on the instructions, as shown below:

Teaching Topic: Rhymes ‘u’ and ‘ü’. Target group: Pakistani learners of Chinese at the elementary level. Teaching Objective: Students can identify and distinguish the rhymes ‘u’ and ‘ü’, pronounce them accurately, and apply them in practical dialogues. Teaching time: One lesson (45 minutes). Teaching materials: Pinyin charts (including mouth diagrams), pronunciation videos/audios, example word and sentence cards, audio

recording equipment (for recording students' pronunciation), quiz sheets. Teaching steps, Step 1: Introducing new knowledge (5 minutes), Activity: Introduce the Hanyu Pinyin system, with special emphasis on the importance of vowels; Tool: Use the Pinyin chart to show the position of 'u' and 'ü'; Interaction: Ask students if they know similar sounds in their mother tongue. Step 2: Pronunciation explanation and practice (15 minutes), Activity: Teacher demonstrates the correct mouth shape and pronunciation of 'u' and 'ü' using charts and videos; students imitate the teacher's pronunciation and the teacher corrects them one by one; Tools: Pronunciation video/audio, recording equipment Interaction: Students practice pronunciation and the teacher provides immediate feedback. Step 3: Identify and Compare (10 minutes), Activity: Play the audio of words containing 'u' and 'ü', students raise their hands to distinguish which rhyme they hear; practice in groups, each group gets a set of word cards, classify and summarise words containing 'Tools: audio playback device, word cards; Interaction: in-group discussion to enhance interaction among students. Step 4: Dialogue practice (10 minutes); Activity: Students use the vocabulary they have learnt to create and act out short dialogues in pairs; Tools: example sentence cards (e.g. 'This is my daughter.' , 'It's raining today.')

Interaction: Teachers circulate during the dialogue practice to ensure the correct use of rhymes. Step 5: Summarise and Assess (5 minutes), Activity: Quickly review the rules and differences in the pronunciation of 'u' and 'ü'; Conduct a quiz to test students' ability to recognise and pronounce the two rhymes; Tools: quiz paper; Interaction: students independently complete the quiz, teacher collects and quickly checks the results. Interaction: students complete the quiz independently, teacher collects and quickly checks to provide feedback. Homework, task: record a short video of students reading out words containing 'u' and 'ü' and trying to create sentences using these words; aim: to reinforce students' pronunciation practice and encourage them to use these sounds in more natural contexts. Feedback and Adjustment: At the end of the lesson, the teaching method is adjusted according to the students' performance and test results to ensure that each student achieves the learning objectives.

Chapter Three: Cognitive analysis of ChatGPT instructional design

In international Chinese language education, the process of teaching is subdivided into three phases: first, in the analysis phase, we determine the students' starting states, analyse the teaching tasks, and specify the teaching objectives; then, in the implementation phase, we design effective teaching strategies to adapt to the students' individual differences and ethnic backgrounds, to stimulate their motivation to learn, and to carry out the teaching plan; and lastly, in the feedback phase, we evaluate the students' learning outcomes to measure the effectiveness of teaching and learning, and diagnose and remedy problematic components. Combining these three levels, we can analyse the strengths and weaknesses of ChatGPT instructional design.

3.1 Strengths of ChatGPT instructional design

First of all, in the analysis stage, ChatGPT identifies the starting point of teaching and clarifies the target group of teaching, i.e. Pakistani learners of Chinese at the

primary level. At the same time, it also defines the goal of teaching: students can identify and differentiate the rhymes ‘u’ and ‘ü’, pronounce them accurately, and apply them in practical dialogues.

In the implementation phase, the ChatGPT programme uses a variety of teaching methods. The programme ensures that students master the Chinese rhymes ‘u’ and ‘ü’ comprehensively and effectively through a combination of visualisation, auditory discrimination training, imitation and practice, interactive learning, immediate feedback and individual guidance, and formative assessment. Firstly, through the use of pinyin charts and mnemonics. Firstly, students are given a visual representation of the parts of speech through pinyin charts and mouth shape diagrams, so that they can directly see how the sounds are produced and the correct mouth shape, thus building up a foundation for accurate visualisation and pronunciation. Then, carefully selected audio materials are used to strengthen students' listening skills so that they can clearly distinguish and correctly pronounce the sounds of “u” and “ü”. In the imitation and practice session, students imitate the pronunciation under the direct guidance of the teacher and ensure the accuracy of pronunciation through repeated practice. Interactive activities such as group discussions and role-plays enhance students' language application and communication skills, making the learning process more dynamic and practical. Each student receives immediate feedback and individual coaching from the teacher throughout the learning process, which not only helps them to correct their pronunciation errors, but also provides support tailored to their individual learning needs. Finally, formative assessment through regular quizzes and homework tasks not only monitors students' progress, but also facilitates students' reflection on their own learning outcomes, thus effectively improving learning outcomes. Such a comprehensive and systematic teaching strategy greatly enhances the quality of teaching and ensures that students can accurately understand, memorise and apply these two key Chinese rhymes, laying a solid foundation for their Chinese learning. The lesson plan specifies the teaching materials, including pinyin charts (including mouth shape diagrams), pronunciation videos/audios, example word and sentence cards, audio recording equipment (for recording students' pronunciation), and quiz sheets. Specific teaching steps are defined: teaching begins with an introduction to the Hanyu Pinyin system, with special emphasis on the difference between the rhymes ‘u’ and ‘ü’, using detailed pinyin charts, and the teacher shows students the pronunciation positions and mouth patterns of the two rhymes, which helps students to build up their initial understanding and visual memory. This helps students to build up their initial understanding and visual memory. The purpose of this section is to provide students with a solid theoretical foundation so that they are able to distinguish the theoretical characteristics of the two sounds before they practice pronouncing them in real life. Next, a high-quality video is used to demonstrate the correct mouth shape and pronunciation method. The demonstration in the video is carried out by an experienced teacher to ensure the standard and accuracy of the pronunciation, and students try to imitate it after watching the video, while the teacher provides immediate feedback and personalised guidance for each student's pronunciation characteristics. This step is very crucial because it deepens students' This step is crucial because it deepens students'

understanding and memory of correct pronunciation through repetition and immediate correction. Students will further practise recognising and differentiating the pronunciation of ‘u’ and ‘ü’ through audio recognition exercises and word sorting games, in which students practise their listening recognition skills by listening to the rhymes of different words, while the sorting games increase the fun of learning and encourage students to learn by listening to the rhymes of different words. At the same time, the sorting game increases the fun of learning and encourages students to deepen their understanding of sounds in a relaxed atmosphere. In the dialogue practice section, students will use the vocabulary they have learned to create and perform short dialogues, a step that not only allows them to apply their theoretical knowledge to actual language use, but also enhances their communication and expression skills. Through role-plays or group dialogues, students can practice the pronunciation of ‘u’ and ‘ü’ in real-life interactions and improve their practical application of the language. At the end of the course, students are given a quick review and a quiz to summarise their learning and assess their results. The quick review helps students to consolidate their memory of the key points in the course, while the quiz tests their mastery of the words ‘u’ and ‘ü’ to ensure that each student gets a practical benefit from the course. The quizzes test their mastery of ‘u’ and ‘ü’ to ensure that each student makes real progress and gains application skills from the programme. Through a series of detailed teaching steps, the programme ensures that students can not only understand ‘u’ and ‘ü’ theoretically, but also recognise and use these two rhymes accurately and effectively, thus taking a solid step forward in their Chinese learning journey. Through a variety of teaching methods and rich interactive activities, it greatly enhances students' interest and efficiency in learning, and effectively helps students understand, recognise and use the rhymes “u” and “ü” in Chinese accurately.

Finally, the feedback phase covers measuring and evaluating results, diagnosis and remediation, for which ChatGPT has designed an assessment methodology: at the end of the lesson, the methodology is adjusted according to the students' performance and test results to ensure that each student achieves the learning objectives.

The lesson plans provided by ChatGPT have demonstrated significant utility in helping teachers to improve the efficiency of lesson preparation and the quality of teaching, providing structured and systematic content for teachers to prepare lessons, which greatly saves time and enhances the design of teaching activities. However, despite its effectiveness in lesson plan generation, ChatGPT still has room for improvement in simulating human cognitive abilities, especially in the areas of linguistic contextualisation, personalised teaching and the use of modern educational technologies. For example, the language characteristics and learning needs of non-native learners are not sufficiently personalised, and the integration of modern technologies such as interactive learning tools and adaptive learning platforms is not extensive enough, which may result in the teaching content not being fully adapted to the specific needs of the students, thus affecting the effectiveness of learning. Therefore, although ChatGPT provides teachers with an effective teaching framework, it still needs to be meticulously adapted to specific teaching situations to ensure that the lesson plans can be better adapted to different groups of students, and to further optimise the

educational application of these AI tools, so as to truly realise an accurate match between the teaching content and students' needs.

3.2 Shortcomings of ChatGPT instructional design

3.2.1 Problems of linguistic background adaptation

For the teaching of the rhymes 'u' and 'ü', the lesson plans may not have adequately taken into account the difficulties Urdu speakers have with these Chinese-specific phonemes. The lack of a high, rounded labial consonant similar to 'ü' in Urdu may confuse learners when trying to recognise and imitate them. For example, when the lesson plan asks students to differentiate the sounds of 'road' and 'green' through listening exercises, they may not be able to accurately pronounce or recognise these sounds due to the lack of reference to the corresponding phonemes in their mother tongue. This mismatch in linguistic background may lead to additional challenges in understanding the new phonemes, affecting students' learning progress and motivation.

3.2.2 Lack of Diverse Learning Styles

Although lesson plans include audio-visual materials to support learning, this approach may not be sufficient for kinesthetic learners who prefer to learn through physical movement or touch. For example, when practising the pronunciation of u and ü, simply watching videos and listening to audio may not be effective for students who need to actually feel and practise their pronunciation skills through 'learning by doing'. Students who need to practise and experience pronunciation skills through 'learning by doing' may not find this approach effective enough. The limitations of this approach may make it difficult for these students to fully grasp the details of pronunciation, thus affecting their linguistic accuracy and confidence.

3.2.3 Insufficient application of modern educational technology

Lesson plans fail to take full advantage of the potential of online education platforms or interactive learning applications, which could have provided a personalised and interactive learning experience. For example, when teaching the pronunciation of 'u' and 'ü', the use of interactive software with simulated pronunciation and instant feedback may be more effective in helping students to understand and correct their pronunciation errors. The lack of such technology may result in missed opportunities for students to practice and receive personalised instruction in virtual environments, limiting the flexibility and interactivity of learning, especially in independent learning outside the classroom.

3.2.4 Insufficient systematic assessment and feedback

Assessment and feedback processes in lesson plans may not cover all aspects of the learning process, focusing on traditional written and oral tests without continuous monitoring and evaluation of actual language use. For example, although students may correctly identify the sounds of 'u' and 'ü' in a classroom test, they may still fail to use these rhymes correctly in an actual dialogue. This suggests that the assessment process does not adequately capture students' overall language skills, and that feedback may not be relevant and timely enough to guide students to make improvements in response to their individual difficulties.

Chapter Three: Cognitive Optimisation of ChatGPT Instructional

Design by Teacher Subjects

4.1 Teaching Strategies to Accommodate Language Differences

In order to help students master the ‘u’ and ‘ü’ rhymes in Chinese, teachers can use the following refinement strategies: comparing charts and videos, creating precise visuals to show the difference between the Chinese ‘u’ and ‘ü’ and similar phonemes in Urdu. and ‘ü’ are different from similar phonemes in Urdu. Compare similar phonemes in Urdu with detailed examples such as ‘lù’ and ‘yú’ in Chinese. Video presentations will include native Urdu teachers and Chinese teachers alternately demonstrating how to pronounce ‘ü’ and ‘u’, explaining the differences in mouth shape and tongue position, and emphasising correct pronunciation techniques. Specialised workshops are set up for students to intensively practise ü and u in the language laboratory or through an online conferencing system. The use of high-tech equipment such as Praat, a real-time sound analysis software, helps students to visualise their pronunciation and make immediate adjustments, and these workshops are held regularly to ensure that students have sufficient time and space to correct and perfect their pronunciation through repetition.

4.2 Activities designed to support diverse learning styles

Teachers can design a series of interactive and hands-on activities for students with different learning styles, especially tactile and kinesthetic learners. For example, pinyin puzzles and hands-on games can be developed to allow students to learn and memorise the sounds of ‘u’ and ‘ü’ by assembling different pinyin parts. This hands-on approach deepens students' understanding of phonemes and adds fun to learning. The games can be played in class or as homework to facilitate home learning and practice. Develop a personalised e-learning platform where students can log in and select modules that suit their learning style, such as video tutorials, interactive exercises or group discussions. The platform is able to track students' progress and preferences, and automatically recommend personalised learning content to make learning more relevant to individual needs.

4.3 Integration of Modern Educational Technology

The use of modern technology can greatly enhance the interactivity of teaching and learning and provide a personalised learning experience. Using platforms such as Kahoot to conduct voice recognition quizzes in which students participate via their smartphones not only increases the interactivity of the classroom, but also makes learning more fun and effective, and quizzes can be designed to include words and sentences with the letters ‘u’ and ‘ü’ to ensure that students can identify and use these rhymes in real contexts. The quizzes can be designed as words and sentences containing ‘u’ and ‘ü’ to ensure that students can recognise and use these rhymes in real-life contexts, and software such as Quizlet can be used to create Chinese phonemes learning cards with audio examples, which can be used at any time to help students review ‘u’ and ‘ü’ on their mobile phones or computers. ‘These cards can be used to help students review the pronunciation of u and ü from their mobile phones or computers at any time,

and they can be automatically updated and adjusted according to the student's learning progress to provide the most appropriate learning materials.

4.4 Establishing a systematic assessment and feedback mechanism

To ensure effectiveness and continuous improvement, teachers can adopt the following assessment and feedback strategies. Design an assessment task in which students are asked to prepare a report in Chinese about their own cultural festivals and present it orally in front of the class. This not only tests their language knowledge, but also examines how they use 'u' and 'ü' in real-life dialogues. Through these activities, teachers are able to assess students' mastery of these two rhymes and their ability to use them in natural contexts. Regular feedback meetings, at least once a month, are arranged for teachers to discuss students' progress and challenges one-on-one, and to provide specific suggestions and improvement programmes. These meetings help teachers understand the specific needs of their students as they progress through the learning process and adjust their teaching methods and content based on the feedback to better support student learning. Through these detailed strategies and activity designs, we are able to not only improve the effectiveness of teaching and learning, but also ensure that every student is able to learn Chinese successfully in an environment that is supportive and responsive to their needs.

These teaching strategies bring significant benefits in terms of accommodating language differences, supporting diverse learning styles, integrating modern educational technologies, and establishing systematic assessment and feedback mechanisms. First, through comparative analyses and specialised pronunciation exercises, these strategies help students overcome the interference of their mother tongue, significantly improve the accuracy of Chinese pronunciation, and accelerate the learning process. In addition, by designing interactive and hands-on activities that match a variety of learning styles, motivation and engagement in learning are increased, thus improving learning outcomes. At the same time, modern technologies such as Kahoot and Quizlet were utilised to increase classroom interactivity and fun, and to support students' independent learning outside the classroom. Finally, continuous and diversified assessment and one-on-one feedback sessions enable teachers to make timely adjustments to their teaching strategies and provide targeted support. These strategies not only improve the quality and efficiency of teaching, but also enhance cultural understanding, global adaptability, and the use of educational technology in international Chinese language education, promoting the popularisation and development of Chinese language education worldwide.

Chapter Five: Summary

This paper discusses the advantages of ChatGTP-generated lesson plans for learning the rhymes 'u' and 'ü' by Pakistani learners of Chinese at the elementary level in terms of their teaching structure, methodology, and content arrangement, and also points out the shortcomings and makes targeted suggestions for improvement. The advantages of the lesson plans in terms of structure, methodology and content organisation are discussed. The main strengths of the lesson plan are its clear structure

and systematic teaching methodology as well as the complete organisation of the content. However, there is still room for improvement in several key areas: firstly, it does not sufficiently take into account the differences in students' linguistic backgrounds, especially for Urdu students, for whom there is no equivalent of the Chinese ü phoneme, which may make learning more difficult; secondly, it does not effectively support students with different learning styles, especially the kinesthetic and tactile ones; and secondly, it does not effectively support students with different learning styles, especially the kinesthetic and tactile ones, and does not provide them with the necessary support. Secondly, the lesson plans do not effectively support students with different learning styles, especially kinesthetic and tactile learners, which limits the diversity and applicability of the teaching methods; furthermore, the lesson plans do not make full use of modern educational technologies, such as interactive platforms and online tools, which can enhance the interactivity of teaching and the motivation of students to learn; lastly, the assessment and feedback mechanisms in the lesson plans are not systematic and comprehensive enough, which makes it difficult for teachers to have a comprehensive understanding of the learning progress and needs of the students and provide timely and specific feedback. provide timely and specific feedback. To address these problems, the following suggestions for improvement were made: firstly, more teaching strategies to accommodate language differences need to be developed and introduced, such as demonstrating pronunciation methods and techniques between different languages through phoneme comparison charts and videos to help students better understand and imitate; secondly, more teaching activities should be designed to support different learning styles, such as providing pinyin puzzles for tactile learners, arranging more hands-on opportunities for kinaesthetic learners, and Secondly, more teaching activities should be designed to support different learning styles, such as providing pinyin puzzles for tactile learners and arranging more hands-on opportunities for kinesthetic learners, which can enhance students' sense of participation and learning effectiveness; in addition, integrating modern educational technologies, such as using Kahoot to conduct online interactive quizzes and Quizlet to create learning cards, which can not only increase the fun of learning, but also provide personalised learning experiences and instant feedback; finally, establishing a more systematic assessment and feedback Finally, the establishment of a more systematic assessment and feedback mechanism to ensure that the content and methodology are effectively adapted to and meet the specific needs of international students through diverse assessment methods and regular feedback sessions. The implementation of these strategies will greatly enhance the quality and effectiveness of teaching and learning, ensure that all students can successfully learn Chinese in an environment that is supportive and responsive to their needs, and will also promote the development of international Chinese language education and increase its global reach and adaptability.

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