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RESEARCH ON GENERATING INTELLIGENT TEACHING RESOURCES FOR CHINESE GRAMMAR BASED ON LARGE LANGUAGE MODEL AGENTS

Abstract. Digital and intelligent technologies open new avenues for developing international Chinese language teaching resources. This paper focuses on leveraging large language models to empower the development of intelligent teaching resources for Chinese grammar, closely aligning with practical teaching needs. It explores the conceptual orientation and practical pathways for constructing intelligent teaching resources. The development of intelligent teaching resources is guided by three principles: overall design adheres to standardization and systematization; content design prioritizes learner-centered dynamic adaptation; and technological application emphasizes multimodal integration and iterative data updates. Taking Level 3 grammar points-commonly taught in the Chinese Proficiency Standards for International Chinese Education-as a breakthrough point, this paper addresses practical needs in Chinese grammar instruction. It generates sample intelligent teaching resources for Level 3 grammar points using a Chinese grammar AI agent, focusing on five resource types: grammar exercise banks, contextual training resources, intelligent grammar diagnostics, teacher support materials, and grammar knowledge mind maps. The analysis of its generation process and outcomes aims to contribute to the development of digital and intelligent teaching resources for international Chinese language education.

Keywords: grammar teaching, intelligent agent, smart teaching resources, Educational Technology, digital and intelligent era.

Introduction

Amidst the global wave of educational digital transformation, artificial intelligence technology is profoundly reshaping the resource ecosystem of international Chinese education at an unprecedented pace. Driven by policy documents such as China Education Modernization 2035, educational informatization has evolved from «technology-assisted» to a new phase of «digital-intelligent integration». International Chinese smart teaching resources represent the technological re-evolution and advancement of digital teaching materials, emerging from the deep integration of smart education concepts, international Chinese education theory, and next-generation AI technology [1]. As a vital vehicle for disseminating Chinese culture, international Chinese education urgently requires AI technology to overcome traditional resource development challenges-such as monolithic resource formats, limited adaptability, and outdated content-to establish a dynamic, intelligent teaching resource system.

Currently, most grammar textbooks are presented statically in print media, with limited dynamic visual resources and insufficient digitalization. Exercise formats predominantly rely on traditional fill-in-the-blank, error correction, and sentence construction, while AI-assisted interactive feedback exercises remain scarce. Multimodal resources such as audio, video, and corpora are underutilized, and teaching resources lack personalized generation capabilities. The core value of AI-empowered digital and intelligent teaching resource development lies in its dual mechanisms of data-driven and intelligent generation, enabling a paradigm shift from «static supply» to «dynamic adaptation» [2]. On one hand, leveraging the generative capabilities of large language models, it can automatically produce grammar analysis templates, contextualized dialogue scripts, and cross-cultural comparison cases, significantly enhancing resource diversity and timeliness. On the other hand, through real-time collection and analysis of learner behavior data, AI agents can dynamically optimize resource content, achieving a closed-loop adaptation of «diagnosis-delivery-feedback» [3]. This precisely matches the learning needs of learners with different native language backgrounds and cognitive styles, enabling personalized construction of teaching resources.

Grammar instruction, as a vital component of international Chinese language education, holds significant importance in Chinese teaching. This paper aims to clarify the conceptual orientation of intelligent teaching resource development. Using case studies such as grammar exercise banks, contextualized training resources, intelligent grammar diagnostics, teacher support resources, and grammar knowledge graphs, it explores the practical implementation of intelligent grammar teaching resources, hoping to provide insights for the concrete implementation of AI-empowered international Chinese language education [4].

1.1 Overall Design Adheres to Standardization and Systematization

The development of intelligent teaching resources must strictly adhere to the Chinese Proficiency Standards for International Chinese Education, using the «three levels and nine grades» difficulty framework as its foundation. It should follow a logical progression from easy to difficult, ensuring a step-by-step arrangement. The presentation and organization of grammar points must guarantee both scientific content and practical applicability, taking into account learners' receptive patterns while aligning with the assessment and teaching standards of international Chinese education.

During resource generation, grammar points should undergo systematic knowledge classification and graded labeling. The proportion of vocabulary exceeding the syllabus must be strictly controlled to prevent sudden difficulty spikes that diminish learning motivation while also reducing teaching pressure on instructors.

In practical design, constructivist knowledge network approaches can be adopted:

Grammar resource development must account for interconnectivity, establishing horizontal links between points based on semantic associations, structural similarities, and usage contexts. This forms an interconnected grammar knowledge network, enabling learners to understand and transfer knowledge through multiple pathways [5].

Grammar resource development should incorporate progressive difficulty. Building upon these networked connections, resources should be vertically stratified based on complexity, cognitive load, and usage frequency, enabling a spiral progression from simple to complex, and from partial to holistic understanding.

This dual «networked + progressive» structure not only helps learners quickly connect new grammar with prior knowledge-facilitating positive knowledge transfer-but also builds a stable grammar knowledge system over long-term learning. Through digital platform visualization, both teachers and students can clearly see relationships between grammar points and learning pathways, enhancing teaching systematization and learner autonomy.

1.2 Content Design Adheres to Learner-Centered Dynamic Adaptation

In constructing smart teaching resources, «learner-centeredness» signifies not only respecting individual differences but also emphasizing dynamic adjustment and precise matching of knowledge content to learners based on their cultural backgrounds, linguistic habits, and learning trajectories. For international Chinese grammar instruction, learners' native language systems and cultural thought patterns often directly influence their grammar acquisition pathways. For instance, Japanese learners tend to place objects before verbs in syntactic order, which conflicts with the Chinese «verb + object» structure. Without proper guidance, this can lead to negative transfer [6].

In this context, cross-cultural communication theory offers a crucial perspective: language learning involves not only mastering rules and structures but also adapting to and integrating cultural contexts and communicative practices. Grammatical points truly come alive when learners grasp their communicative functions within specific cultural situations. Therefore, the content design of intelligent teaching resources should achieve dynamic adaptation in two key areas:

Reasonable embedding of cultural contexts: Consciously integrate typical scenarios from the target culture and the learner's native culture into grammar explanations and example sentence construction. For instance, when teaching «虽然……但是……» (although...but...), present not only the structural usage but also contrast Chinese and Western politeness strategies. This helps students understand that in Chinese contexts, concessive structures often serve to soften tone and balance relationships.

Proactive adaptation to cultural differences: Tailor the context, exercises, and communicative tasks for grammar points to learners from diverse cultural backgrounds, making them more relevant to learners' real-life situations. For instance, in overseas classrooms, teaching «把» sentences can be integrated with common local scenarios (such as market shopping or holiday preparations), reducing unfamiliarity while increasing learners' willingness to use the structure in authentic communication.

This dynamic adaptation, anchored in learners' cultural experiences, not only makes grammar instruction more contextually relevant but also helps learners apply learned grammar more naturally in cross-cultural communication. This facilitates a shift from merely «being able to use» to «using appropriately». By integrating learning analytics technologies (such as click paths, dwell times, and error distributions), the AI agent can continuously optimize the alignment between cultural contexts and grammatical materials in the background. This creates a dynamic, continuous cycle where resource generation and cultural adaptation reinforce each other [4].

1.3 Technology Application Emphasizes Multimodal Integration and Data Iteration

In the digital intelligence era, technology serves not only as a tool for presenting smart teaching resources but also as the driving force behind their continuous optimization and iteration. Multimodal integration in grammar teaching resources means the synergistic use of text, audio, video, animation, interactive tasks, and other formats. This makes abstract grammar rules tangible, visible, and usable through rich sensory input. For instance, when explaining grammatical points with distinct structures, AI agents can automatically generate text examples with highlighted structures or dynamically annotated syntactic diagrams, making grammatical components immediately clear. During dialogue practice sessions, they can generate contextualized videos or animations, allowing students to repeatedly use target grammar within immersive communicative scenarios [6].

However, what truly enhances learning outcomes is not merely the multimodal presentation itself, but the underlying adaptive learning philosophy-enabling resources to «perceive» learners' proficiency levels, habits, and needs, and adjust accordingly. For instance, when a learner repeatedly struggles with «ba» constructions, the AI agent can automatically increase micro-lesson videos, contextual tasks, and targeted exercises for that structure. It can also revisit previously learned points at opportune moments, delivering precise, personalized intervention. Adaptive learning theory emphasizes that instruction should be a dynamic cycle of continuously collecting data, analyzing patterns, and adjusting strategies. Smart teaching resources leverage multi-dimensional data-such as learning heatmaps, error rate analysis, and task completion rates-to identify learning challenges and common pitfalls in real time. This feedback then informs the next round of resource optimization. For instance, when the AI detects widespread confusion over tense coordination in a specific grammar point, it automatically pushes supplementary explanatory videos or interactive drills, while closely tracking mastery in subsequent assessments [7].

This integration of multimodal fusion and adaptive iteration enables intelligent grammar teaching resources to not only be «generated once» but also to «grow organically». They continuously refine themselves with each use and feedback cycle, achieving a closed-loop process from content generation to ongoing optimization. This provides efficient support for teachers while constructing a learning experience for learners that better aligns with their individual pacing and cognitive pathways.

Methods and materials

This paper selected the *Coze* platform for agent construction. Coze is a professional agent development platform that offers developers a zero-code or low-code creation path alongside visual tool orchestration. This enables users without programming training to build agents aligned with their expectations through natural language interaction and workflow creation. Its core strength lies in «modularizing» the agent construction process, allowing developers to focus on business logic rather than technical details. Compared to Dify and Fast GPT platforms, Coze prioritizes user interaction experience. It demonstrates broader adaptability for deployment on domestic platforms while supporting integration with multiple large models globally and enabling multimodal interactions.

Results and Discussion

The given diagram (Figure 1) presents the specific process for building an AI agent using the Coze development platform. As shown above, the development process comprises the following step: (1) Prompt design, which includes defining the agent's role, specifying generation requirements, providing response examples for the five resource types, outlining workflow logic and output format specifications, and setting generation boundary constraints. To ensure professionalism, resources primarily focus on Chinese grammar instruction and do not cover teaching content in other languages or domains. (2) Underlying model configuration. The underlying model for this agent is the Deepseek R1 model. (3) Plugin selection: To meet the requirements for five types of teaching resources, corresponding plugins are chosen to assist generation. For instance, a text correction plugin is added to support intelligent grammar diagnosis. (4) Professional knowledge base construction: To ensure the professionalism of the agent's generated content, relevant specialized knowledge is specifically incorporated, such as the new edition of the «Chinese Proficiency Standards for International Chinese Education» and related grammar teaching and grammar knowledge books. (5) Dialogue Experience Configuration: Set opening remarks, background images, user input methods, etc. (6) Debugging and Preview: Interact with the agent and fine-tune previous settings based on generated content to achieve satisfactory results [8], [9].

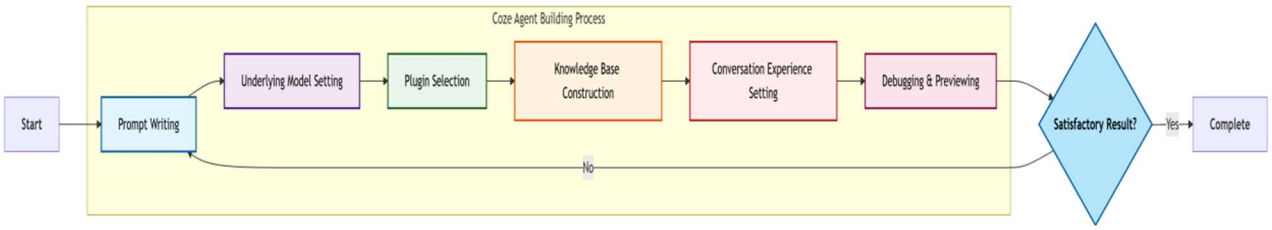

Figure 1 – The specific process for building an AI agent

The AI-generated exercise database transforms traditional static, uniform, and one-way question banks into dynamic, personalized, and interactive intelligent resources. Strict adherence to the «International Chinese Language Education Chinese Proficiency Level Standards» ensures precise control over generated difficulty levels [10], [11]. The AI can produce multiple-choice questions, fill-in-the-blank exercises, error-correction tasks, sequencing problems, and sentence-completion exercises, complete with corresponding answers and detailed explanations. This eliminates monotonous question formats, enabling comprehensive training of students' grammar skills. Highly targeted, it can generate error-correction exercises based on common class-wide mistakes or issues specific to students from particular native language backgrounds, achieving precision teaching (Table 1, 2).

Table 1 – Prompt Examples

Description	Prompt
1	2
Generate grammar exercise database	1. When users request a grammar exercise database, inquire in detail about the target learners' proficiency level (specify clearly as beginner, intermediate, advanced, or more granular sub-levels) and the desired scope of grammar points to practice (down to specific grammar rules, parts of speech usage, etc.). 2. Based on the user's information, meticulously generate a grammar exercise question bank featuring diverse question types (e.g., multiple-choice, fill-in-the-blank, error correction, sentence rearrangement, sentence construction). Each question type should include a reasonable number of questions with a graded difficulty level. Response Example Grammar Exercise Library Multiple Choice: Which of the following sentences is grammatically correct? ( ) A. I went to eat yesterday.

Continuation of Table 1

1	2
	B. Yesterday I went to eat. C. I went to eat yesterday. Fill-in-the-blank: He ____ (verb) a book. Error Correction: I see him often in the library. (Correct the grammatically incorrect sentence) Sentence Rearrangement: Rearrange the following words into a grammatically correct sentence: «like, I, singing, very» Sentence construction: Use «because...so..». to form a sentence. Answers: Multiple Choice: B; Fill-in-the-blank example: bought; Error correction: I often see him in the library; Sentence rearrangement: I very much like singing; Sentence example: Because it rained today, I didn't go out. End of example

Table 2 – Sample exercises generated using Level 2-3 result complement knowledge points

Description	**Sample Exercise**
1	2
Generating Grammar Practice Questions Using Level 2 and 3 Result Complement Knowledge Points	I. Multiple Choice Questions In the sentence «I finally bought the train ticket» «bought» indicates ( ) A. An attempt at an action B. Action failure C. Action completed and goal achieved D. Action in progress Hint: Level 3 result complements emphasize that the action achieves the expected outcome. II. Fill in the Blanks This Chinese character is too difficult; I've _____ (written it wrong) five times. Hint: Use «wrote incorrectly» to indicate repeated errors. The ball is flying over-quick, catch it! Hint: Level 3 complement indicates the completion of an instantaneous action. III. Error Correction I washed the clothes clean. (Correct the grammatically incorrect sentence) Hint: The result complement must immediately follow the verb. He finally bought train tickets and arrived. (Correct the sentence) Hint: Pay attention to the correct word order for level-three complements. IV. Sentence Rearrangement Arrange the words into a correct sentence: «Learn / I / Chinese / haven't / yet» Hint: The result complement expresses the outcome of learning. «Catch / ball / he / hasn't» Hint: Position of the complement in negative forms. V. Sentence Construction Form a negative sentence using «hear clearly». Hint: Note the position of the negative word. Form an interrogative sentence using «take away». Hint: Usage of the third-level complement in interrogative sentences.

Continuation of Table 2

1	2
	Answers and Explanations Multiple Choice Questions C Explanation: «买到» indicates that the action of «buying» has successfully achieved its goal. Fill-in-the-blank wrote incorrectly Analysis: Repeated writing resulted in incorrect outcomes. Catch Analysis: The action of «catching» is completed instantly and achieves the goal. Error Correction I washed the clothes clean. Analysis: The result complement «clean» must immediately follow the verb «washed». He finally bought the train ticket. Analysis: The third-level complement «to» must immediately follow the verb «buy». Sentence Rearrangement I haven't mastered Chinese yet. Analysis: «Learn» functions as a complement indicating the outcome of learning. He didn't catch the ball. Analysis: «Catch» indicates the completed state of the action «to catch». Sentence Construction Exercise I didn't hear the teacher's question clearly. Analysis: In the negative sentence, «hear clearly» indicates an unachieved result. Did he take the book? Analysis: In the question, «took» indicates a completed action.

While developing contextual teaching resources, teachers can also apply the principle of extracting typical contexts from the «Three-One Grammar» framework. By utilizing typical contextual scenarios to generate dialogue exercises, grammatical points emerge within story-driven, emotionally resonant settings. Students internalize formal rules through understanding overall meaning, helping them grasp the practical usage scenarios of grammatical structures. This approach prevents a disconnect between learning and application, facilitating a shift in grammar learning from «what to learn» to «what to use» (Table 3).

Table 3 – Prompt Word Examples

Description	Prompt
1	2
Generate Contextualized Training Resources	1. When users request contextualized training resources, inquire in detail about their desired scenario themes (e.g., shopping, asking for directions, ordering at a restaurant, visiting a hospital, airport check-in) and the specific grammar points involved (down to the usage of a particular word or sentence structure). 2. Create vivid, natural, and real-life scenario dialogue examples based on the user's specified theme and grammar points. The dialogues should fully demonstrate the relevant grammar points while maintaining a degree of interest and practicality. Response Example Scenario Theme: Restaurant Ordering

Continuation of Table 3

Grammar Point: Usage of «要»
Scenario Dialogue:
A: Waiter, I'd like to order.
B: Sure, what would you like to order?
A: I'll have Kung Pao Chicken and a bowl of rice.
B: Alright, anything else?
A: No, thank you.
Example ends

Also, there AI agents can generate dialogue scenario to develop grammar skills, depending on certain grammar points to be covered.

Here are the samples of exercises, generated using Level 2 and 3 result complement knowledge points:

Scenario Theme: Library Self-Study

Grammar Points Covered: Result Complements (understand / hear clearly / finish writing / buy / catch / take away)

Scenario Dialogue:

Xiao Ming: Xiao Hong, did you understand the ancient text the teacher assigned? I've been reading it for half an hour and still don't get it.

Xiaohong: I didn't get the third paragraph either, but I read the annotations carefully. Why don't you look up the translation on your phone?

Xiao Ming: I forgot to charge it last night, so it won't turn on now. Did you finish your homework?

Xiaohong: Math's done, but I haven't finished the physics problems. Hey, did you get the reference book you ordered?

Xiao Ming: Got it! But the delivery guy left it at the door yesterday, and the cleaning lady almost took it. Luckily I grabbed it just in time.

Xiaohong: That was close! Did you pick up that Grammar

Grammar AI diagnostics empower students to self-assess learning outcomes during independent study, enabling interactive feedback and evaluation of assignments and content. Key advantages include:

1. Timely feedback: In traditional settings, students must wait for teacher grading, with feedback often delayed until the next day or longer, missing the optimal window for correction. Intelligent systems provide immediate feedback, capturing the best moment for correction and achieving better results. Additionally, smart feedback enables precise error correction by pinpointing mistakes to specific grammar rules. This helps students progress from merely knowing the answer to understanding why it's correct.

2. Intelligent grammar diagnosis helps build personalized learning paths. By continuously tracking and analyzing student errors to create user profiles, it intelligently recommends targeted practice resources, enabling tailored learning experiences.

3. Grammar AI diagnostics reduce student anxiety by eliminating direct teacher interaction. Students can practice repeatedly in a pressure-free environment, receiving machine feedback devoid of subjective emotional bias-particularly beneficial for introverted learners (Table 4).

Table 4 – Prompt Examples of Grammar Intelligence Diagnosis

Description	Prompt
Grammar Intelligence Diagnosis	1. When a user submits a sentence containing a Chinese grammar error, precisely identify the grammatical mistake and provide a detailed explanation of the error (not only stating the violated grammar rule but also offering examples of correct usage). 2. Provide multiple correct sentence examples demonstrating proper usage of the grammatical structure in different contexts. Response Example Original Sentence: I already mailed the letter yesterday. Grammar Error: In «把» sentences, time expressions typically precede the «把» verb. The placement of «昨天» is incorrect in this sentence. Reason for Error: Violates the grammatical structure of «把» sentences. In such constructions, the time marker should precede the «把» verb phrase to indicate when the action occurred. For example: «我昨天把作业做完了» («I finished my homework yesterday»), where «昨天» comes before the verb phrase «把作业» («把作业»). Correct sentence: - I already mailed the letter yesterday. - I organized the documents yesterday. - He washed the clothes this morning. End of examples
Description	**Syntax Intelligence Diagnosis Sample**
Diagnosing issues with «我没吃完了» and «我不吃完了»	Syntax Intelligence Diagnosis Original Sentence Analysis **I haven't finished eating** Grammatical Error: Incorrect use of «了» following the negative form of the resultative complement. Reason for Error: The negative form of a resultative complement (e.g., «吃完») requires the structure «没有 + V + 结果补语» and cannot include «了». «了» indicates completion of an action, while «没有» already explicitly expresses «incompletion,» creating a semantic conflict. The correct structure is: «没吃完» (denying the result of the action). **I haven't finished eating.** Grammatical error: Incorrect use of «不» to negate the result complement. Reason for error: «不» is used for subjective intention or habitual negation (e.g., «I don't want to eat»), while «没有» describes an unfulfilled objective outcome. «吃完» emphasizes the outcome of an action, requiring «没有» for negation (objective fact), not «不» (subjective intention). Correct structure: «没吃完» (haven't finished eating). Correct sentence example I haven't finished eating. Function and meaning:

Continuation of Table 4

«没有» objectively describes that the action of «eating» did not reach the result of «finishing» (e.g., leftover food).

Example: «I didn't finish my breakfast because I ran out of time».
He didn't want to finish eating.
Function and meaning:
«Refusal» expresses a subjective rejection of completing the action (e.g., voluntarily stopping eating due to fullness).
Example: «The food was too salty, so he didn't want to finish it».
The children didn't finish the cake.
Function and Meaning:

«没有» emphasizes the objective result that the cake was not fully consumed.

Example: «The party ended, and the children didn't finish the cake».

Intelligent agents assist teachers in generating multimodal teaching support resources, enabling one-click creation of text-image combinations, case studies, PPTs, and activity designs. This enhances lesson preparation efficiency and reduces teachers' workload. Multisensory knowledge input captures student attention and boosts learning engagement. Incorporating local cultural elements during generation further enhances student acceptance. Simultaneously, timely resource creation prevents obsolescence, ensuring teaching materials remain current and continuously refined. This approach adapts to regional characteristics, achieving localized instructional resources.

The ultimate goal of AI-assisted generation is not to replace teachers, but to liberate them from tedious, repetitive tasks. This empowers educators to focus on higher-value intellectual work-addressing students' emotional needs and individual differences-and performing tasks beyond AI's capabilities.

These intelligently generated multimodal resources, with their high adaptability and rich expressiveness, are establishing a novel «teacher-AI» collaborative teaching model. Teachers retain control over core instructional design and decision-making, while AI serves as an efficient execution assistant. Together, they create more vivid and personalized learning experiences for students. This undoubtedly represents a significant stride toward the digital and intelligent future of international Chinese language education (Table 5).

Table 5 – Prompt Examples of Teacher Support Resources

Description	Prompt
Generate Teacher Support Resources	1. When users request teacher support resources, inquire deeply about their specific needs (e.g., PPT themes, image types, video content direction, instructional activity design) and the intended teaching scenarios (e.g., lesson introductions, knowledge explanations, classroom exercises, post-class reviews) and student levels (detailed to specific grade levels, language proficiency levels, etc.). 2. Based on user requirements, comprehensively provide examples of relevant resources such as PowerPoint outlines, image descriptions (including composition, elements, color schemes, design intent, etc.), video content scripts (covering shot numbers, camera angles, visuals, dialogue, duration, sound effects, etc.), and instructional activity design plans. Response Example Teaching Activity Design Plan: - Activity Theme: Simple Sentence Challenge - Activity Objective: Reinforce students' understanding and application of simple sentence structures through gamified learning - Activity Flow: - Divide students into groups - The teacher presents a series of simple sentences for each group to analyze and race to answer - Reward outstanding groups ===End of Example===

The grammar mind map generated by the grammar AI transforms scattered, abstract, and complex grammatical rules into a visual, structured, and networked presentation. It provides a reliable cognitive scaffold for both teaching and learning, integrating fragmented grammar points into a logically coherent, hierarchically organized knowledge system. This helps teachers grasp the overall picture and internal connections of grammatical knowledge.

Mind maps, help students establish a macro-level grammatical framework, understand each knowledge point's position and function within the whole, and thereby form systematic knowledge. Guided by the map, students can conduct structured, logical review to quickly identify and fill knowledge gaps. This facilitates students' autonomous construction of knowledge networks. The samples of generating mand map are presented in the Table 6.

Table 6 – Prompt word examples of Grammar Knowledge Mind Map

Description	Prompt
Generate Grammar Knowledge Mind Map	1. When users request a grammar knowledge map, clarify the specific scope of grammar knowledge desired (e.g., subcategories within parts of speech, classifications of specific sentence patterns, or a particular module within the grammatical system). 2. When generating the mind map, use clear and concise language to describe each node's content. Add brief explanations or examples for important nodes or concepts that may be difficult to understand. Present the information in a visual text structure and include necessary annotations to help users grasp the logic and content of the mind map. Response Example Grammar Knowledge Mind Map Parts of Speech Noun Names of people or things (e.g., «table,» «teacher») Time nouns (e.g., «yesterday,» «next year») Directional nouns (e.g., «up,» «down»)

The given chart presents a comprehensive teaching framework for Chinese potential complements (可能补语), (Figure 1) organized into five interrelated components that guide instruction from linguistic form to pedagogy, assessment, and cultural integration (Figure 2).

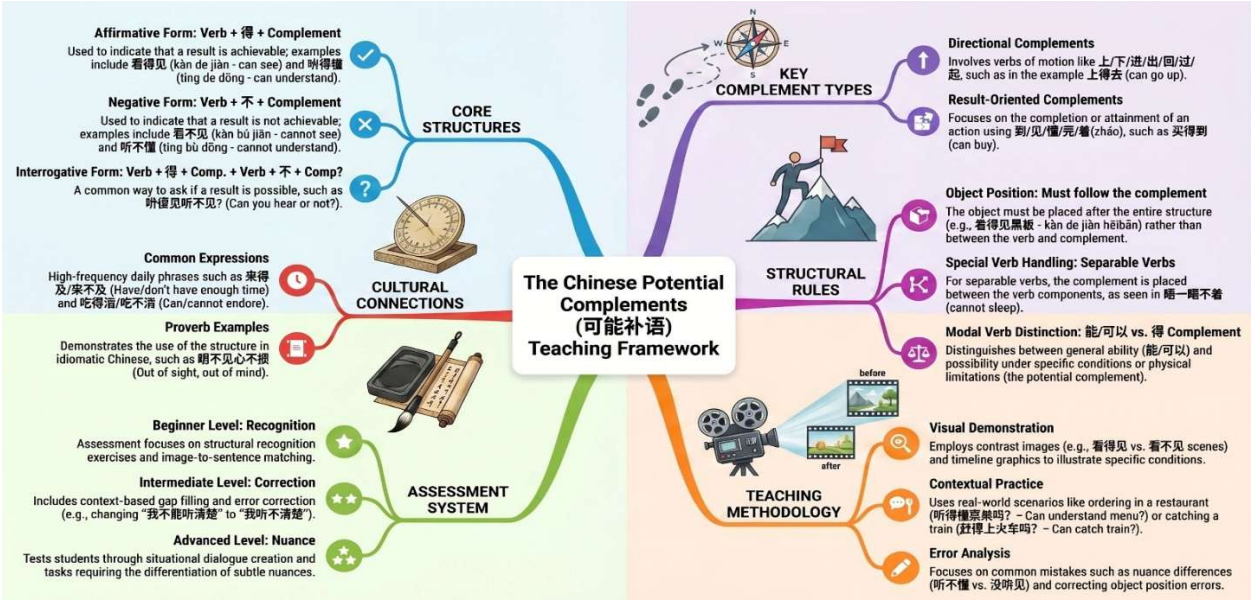

Figure 2 – Chinese Potential Complements

Conclusion

Next-generation AI technology will comprehensively empower the development of intelligent teaching resources for international Chinese language education. By leveraging7 AI's strengths in real-time generation and dynamic adaptation, static print-based teaching materials can be absorbed and reconfigured into dynamic resources that meet contemporary educational demands. Simultaneously, AI integration into teaching resource development will significantly enhance both efficiency and quality. This paper takes Chinese grammar teaching resource development as its entry point, elucidating three guiding principles for intelligent teaching resource creation. Grounded in the practical needs and challenges of Chinese grammar instruction, it selects five categories of intelligent teaching resources, generates sample examples, and discusses their practical implementation pathways.

Exploratory efforts in generating grammar exercise resources and contextualized training resources still face limitations, such as the need for enhanced precision in question bank exercises. As artificial intelligence technology advances, with its recognition, adaptation, and generation capabilities continually improving, subsequent efforts will focus on producing higher-quality intelligent teaching resources to drive the digital transformation and development of international Chinese language education.

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ІРІ ТІЛДІК МОДЕЛЬ АГЕНТТЕРІНЕ НЕГІЗДЕЛГЕН ҚЫТАЙ ТІЛІ ГРАММАТИКАСЫ БОЙЫНША ИНТЕЛЛЕКТУАЛДЫ ОҚУ РЕСУРСТАРЫН ГЕНЕРАЦИЯЛАУ ЖӨНІНДЕГІ ЗЕРТТЕУ

Аннотация. Сандық және интеллектуалды технологиялар халықаралық қытай тілі білім беруінде жаңа мүмкіндіктер ашады. Бұл мақала ірі тілдік модельдерді пайдалану арқылы қытай тілінің грамматикасы бойынша интеллектуалды оқу ресурстарын әзірлеуге, яғни нақты оқыту қажеттіліктеріне бағытталған тәсілдерге назар аударады. Интеллектуалды оқу ресурстарын құрудың тұжырымдамалық бағыты мен практикалық жолдары қарастырылады. Ресурстарды әзірлеу үш қағидаға негізделеді: жалпы дизайн - стандартизация мен жүйелілікке сай болуы; мазмұн дизайны – оқушыға бағытталған динамикалық бейімделуге ие болуы; технологияны қолдану – мультимодальды біріктіру мен деректерді итеративті жаңарту принципіне сүйенеді. Халықаралық қытай тілі білім беру стандартындағы жиі оқытылатын III деңгей грамматикалық пункттерін талдау арқылы, мақала қытай грамматикасын оқытудың нақты қажеттіліктерін шешуге бағытталады. Қытай тілі грамматикасының интеллектуалды агенті арқылы III деңгейге арналған оқу ресурстарының үлгілері жасалды: грамматикалық жаттығулар банкі, жағдайлық (контекстік) жаттығу ресурстары, грамматика бойынша интеллектуалды диагностика, мұғалімге арналған әдістемелік қолдау материалдары және грамматикалық білімнің ақыл-карталары. Бұл ресурстарды генерациялау процесі мен нәтижелерінің талдауы халықаралық қытай тілі білім беруінде сандық және интеллектуалды оқу ресурстарын дамытуға үлес қосуға бағытталған.

Тірек сөздер: грамматиканы оқыту; интеллектуалды агент; ақылды оқу ресурстары; білім беру технологиялары, сандық және интеллектуалды дәуір.

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ИССЛЕДОВАНИЕ ГЕНЕРАЦИИ ИНТЕЛЛЕКТУАЛЬНЫХ УЧЕБНЫХ РЕСУРСОВ ПО ГРАММАТИКЕ КИТАЙСКОГО ЯЗЫКА НА ОСНОВЕ АГЕНТОВ КРУПНЫХ ЯЗЫКОВЫХ МОДЕЛЕЙ

Аннотация. Цифровые и интеллектуальные технологии открывают новые возможности для разработки учебных ресурсов по международному преподаванию китайского языка. В данной статье основное внимание уделяется использованию крупных языковых моделей для создания интеллектуальных учебных ресурсов по грамматике китайского языка, тесно ориентированных на практические потребности преподавания. Исследуются концептуальные ориентиры и практические пути построения интеллектуальных учебных ресурсов. Разработка интеллектуальных учебных ресурсов основывается на трёх принципах: общая конструкция придерживается стандартизации и системности; дизайн содержания ориентирован на учащегося и динамическую адаптацию; применение технологий делает упор на мультимодальную интеграцию и итеративное обновление данных. В качестве точки прорыва рассматриваются грамматические пункты уровня 3, которые широко преподаются в соответствии со «Стандартом уровней владения китайским языком для международного образования». В статье создаются образцы интеллектуальных учебных ресурсов для

грамматических пунктов уровня 3 с помощью грамматического интеллектуального агента по китайскому языку. Рассматриваются пять типов ресурсов: банк грамматических упражнений, контекстуальные тренировочные ресурсы, интеллектуальная грамматическая диагностика, материалы поддержки для преподавателей и интеллект-карты грамматических знаний. Анализ процесса и результатов генерации направлен на содействие развитию цифровых и интеллектуальных учебных ресурсов для международного преподавания китайского языка.

Ключевые слова: преподавание грамматики, интеллектуальный агент, интеллектуальные учебные ресурсы, образовательные технологии, цифровая и интеллектуальная эпоха.

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