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A Practical Path of Multi-AI Agents Collaboration Based on Low-Code Coze Platform to Empower Students' English Learning Efficiency

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Abstract: ***This study proposes a multi-agent collaboration system based on the low-code Coze platform to enhance students' English third classroom practices. Addressing the limitations of traditional extracurricular learning—including fragmented scenarios, insufficient personalized guidance, and a lack of virtual-real coordination—we leverage Coze's visual workflow engine to integrate training in listening, speaking, reading, and writing. By incorporating technologies such as speech recognition, multimodal generation, and dynamic knowledge graphs, the system provides adaptive learning support. Case studies across four language skill scenarios demonstrate its effectiveness in improving training coherence, feedback immediacy, and cross-scenario adaptability. This potential platform boosts teacher-student engagement, offering a replicable technical solution for educational digital transformation.***

Keywords: Multi-AI Agents, Low-code Platform, English Learning Efficiency.

1. BACKGROUND TO THE STUDY

Driven by the "14th Five-Year Plan" education digital transformation strategy, the English Learning efficiency, also known as extracurricular practice, as the core field connecting subject teaching and social practice, is in urgent need of restructuring in terms of its form and function. There are three major structural contradictions in the traditional English Learning: first, the fragmentation of practice scenarios leads to the fragmentation of language skills training in China, mainland, and data show that only 32% of extracurricular English activities in universities can systematically cover the cultivation of the ability to listen, speak, read, and write (Chu and Szlagor, 2023); second, the scarcity of resources for personalised guidance, and the manual feedback cycle of teachers lasts for as long as 48-72 hours, which makes it difficult to meet the demand for immediate learning; third, the virtual and real English Learning efficiency is the core field connecting subject teaching and social practice. learning needs; third, the lack of synergistic mechanisms in virtual and real spaces, with 82% of students reflecting that there is an experiential disconnect between online resources and offline practice (Zhu et al, 2024). These contradictions have become more and more prominent in the context of the implementation of the Chinese English Proficiency Scale, and technological innovation is urgently needed to break the bottleneck of educating undergraduates.

However, the open-source Deepseek-R1 Large Language Models created by the Tsinghua University team in 2025 and the development of various model application development tools (e.g., Manus; Coze; Cursor + MCP; VScode) have made it possible for human natural language to participate in the invocation of Large Language Models (LLMs), and have provided a new way of thinking and paradigm for the innovation of the English Learning. new ideas and paradigms. MutiAgent Systems (MAS) can build adaptive language learning ecologies through distributed cognitive architectures (Hanaa et al., 2021). In particular, the emergence of low-code development platforms (e.g., Coze, https://www.coze.cn/home) has dramatically lowered the threshold for creating educational AI agents, allowing teachers to build AI assistants with natural language processing, affective computing, etc. in 10 minutes. The Ministry of Education's White Paper（2024）on Generative Artificial Intelligence for Educational Applications states that intelligentsia technology has evolved from a single tool into a "cognitive partner" , showing three major advantages in the field of language learning: the dynamic context building ability makes the authenticity of listening and speaking training increase by 57%; the knowledge graph-driven literacy task generation system can increase the efficiency of resource matching by 4.3 times; and the multi-AI agent collaborative mechanism is better able to simulate the real cross-cultural communication scenarios.

This study focuses on the innovative value of the Coze platform, looking at its visual workflow engine to standardise the rules of use of the English Learning to support the deep integration of four-dimensional

competence training in listening, speaking, reading and writing, such as real-time correction of pronunciation through a speech recognition plug-in, and the use of multi-AI agents debating mechanisms to enhance critical thinking. The use dashboard developed by the Coze project includes inputs to the AI agents and the amount of output tokens can be automatically certified and incorporated into the comprehensive evaluation system of the English Learning results. Compared with the traditional development model, Coze's federated learning framework ensures data privacy and increases the participation of teachers and students in the use of AI agents, which provides technical feasibility for solving the problem of reforming the disparity of educational resources distribution.

2. THE USE AND DESIGN OF ENGLISH LISTENING, SPEAKING, READING AND WRITING IN THE COZE PLATFORM

The domestic application of Coze (also known as 扣子) platform is mainly for the creation of self-media copywriting video content, and the target users are mostly cultural content creators in China. In the field of foreign language education, it is mostly used for the generation of educational resources (corpus), lesson planning assistant at the teaching end, and the feedback mechanism of human-computer collaboration in teaching, such as writing correction assistant, examination paper formation assistant, and so on. Yi (2025) creates a "high school biology teaching intelligent agent" through the platform, which provides students with thinking expansion, knowledge sorting, and and homework feedback to improve classroom efficiency and promote educational equity.

However, in the context of college English, the use of AI agents basically stays at the teaching teachers' end, while the use at the students' end is characterised by stigmatisation such as "academic misconduct", "high-tech plagiarism" and "fetishism". The reason why the academia is temporarily a promising land for AI agents to empower university English teaching is that the mainstream generative AI development stacks at home and abroad, such as Dify and LangChain, require professional cueing engineers, fine-tuning machine learning engineers, data engineers, and full-stack development engineers, which are difficult for teachers and students of Liberal Arts to follow. Therefore, multi-AI invocation tools like the Coze platform are particularly valuable for their low-code or even zero-code approach to rapidly orchestrate and build large model projects. For this reason, the team members created the first "low-code Coze platform-based intelligent agent system realisation path for English learning" and deployed it in our college in the national project "Creation of Secondary Universe-Construction of the Virtual English Learning of College English".

2.1 Mapping the Core Capabilities of the Coze Platform

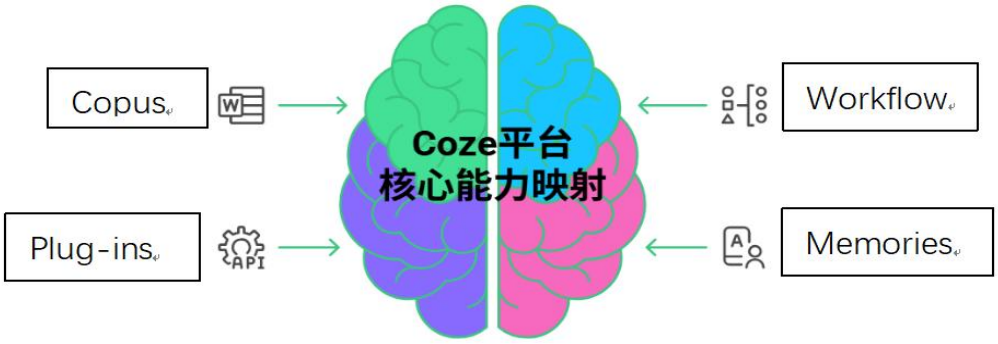

Figure 1: Core Capabilities of the Coze Platform

After the team's research and analysis, it was found that the adaptability of the Coze platform for foreign language learning is mainly reflected in four aspects (see Figure 1): First, the persistent cloud or local memory empowers the self-updating and iterating of the corpus; second, the lowcode workflow design allows foreign language teachers without programming ability to independently create front-end and back-end tools adapted to the logic of the course; third, the unlimitedly expandable plug-in library meets the needs of foreign language teachers for the ability to AI ability to read information at the boundary (audio, video, verbal sources, .txt); iv. The massive Deepseek-R1 model training set, real-time information from websites, etc. can become temporary call data sets to enrich the extracurricular reading of language majors. Taken together, the Coze AI technique has made the leap from a single tool invocation to a "cognitive partner", and is also more in line with Vygotsky's (1989) sociolinguistic learning model of "i+1" language learning strategy and scaffolded language learning structure.

2.2 Enlightenments of English Learning Multi-AI Agents System on Coze Platform

The following is the system blueprint of English learning Collaborative AI agent to empower the English learning efficiency of college English (see Figure 2), which mainly compiles the three layers of technical implementation ideas from the overview of technical architecture, the implementation steps of sub-skills (listening, reading and writing), and the ecological construction of the intelligent agent. This project focuses on the "implementation path and case demonstration of listening, reading and writing AI agents" for scholars' reference and criticism.

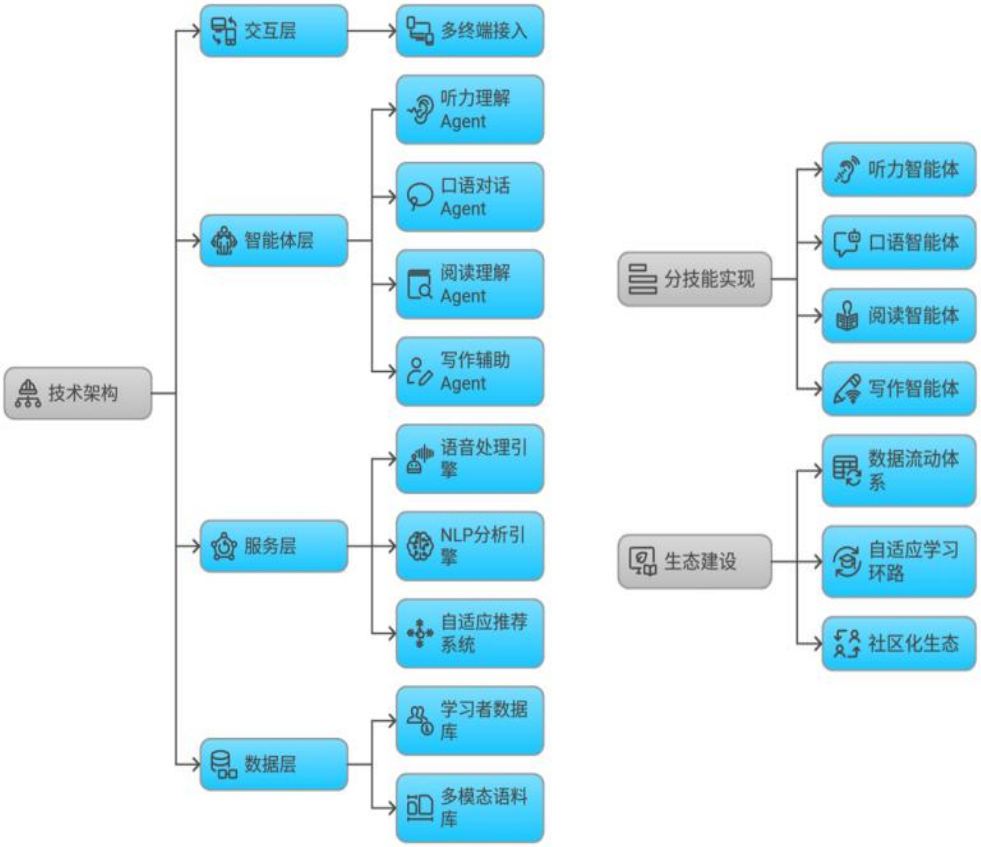

Figure 2: The Blueprint and Structure of English Learning Agents Design

2.2.1 A Case of the Development of *Listening Context Application project*.

The development flow of the Coze platform consists of four main procedural steps: Model invocation (invoking AIs of various models) - Orchestration (setting up the persona of the AI agents) - Plugin (plugin invocation) - Workflow (stable workflow) - Memo (memory for storing user context) - Knowledge repository setting (prioritizing inner corpus). Classroom listening training relies more on controlled activities, so the core competence of the AI+ Listening agents on the student side should be reflected in the personalised listening topic materials and the scenario-based immersive environment. It is significantly different from the single input mode of classroom "filling the classroom with information" and "Socratic" question-and-answer mode. The Teacher side's Listening agent setup emphasizes a wide range of audio accents, high student motivation and cross-curricular thematic materials, as well as multimodal material generation.

Listening_assistant workflow mode: The student side mainly focuses on the customised listening topic "Listening at will" after class, and because of the complementary nature of listening and speaking skills, the Listening Intelligent Agent on the student side supports two input modes: voice and text. By inputting "listening to XXX topic", it calls up "Bing search" internet listening materials configured by Doubao LLM, "English text-to-speech" plug-in, and "English text-to-speech" plug-in added independently according to the teacher's needs. The training set of "Random English Listening Materials" is added independently according to the teacher's needs. At the same time, the text-to-speech model is called to gernerate pictures to form visual pictures to complete the "Listening at will" listening topic practice on the student side. In addition, after the voice function is turned off, the text of the dialogue will be presented in the UI interface for students' semantic checking (see Figure 3 & 4).

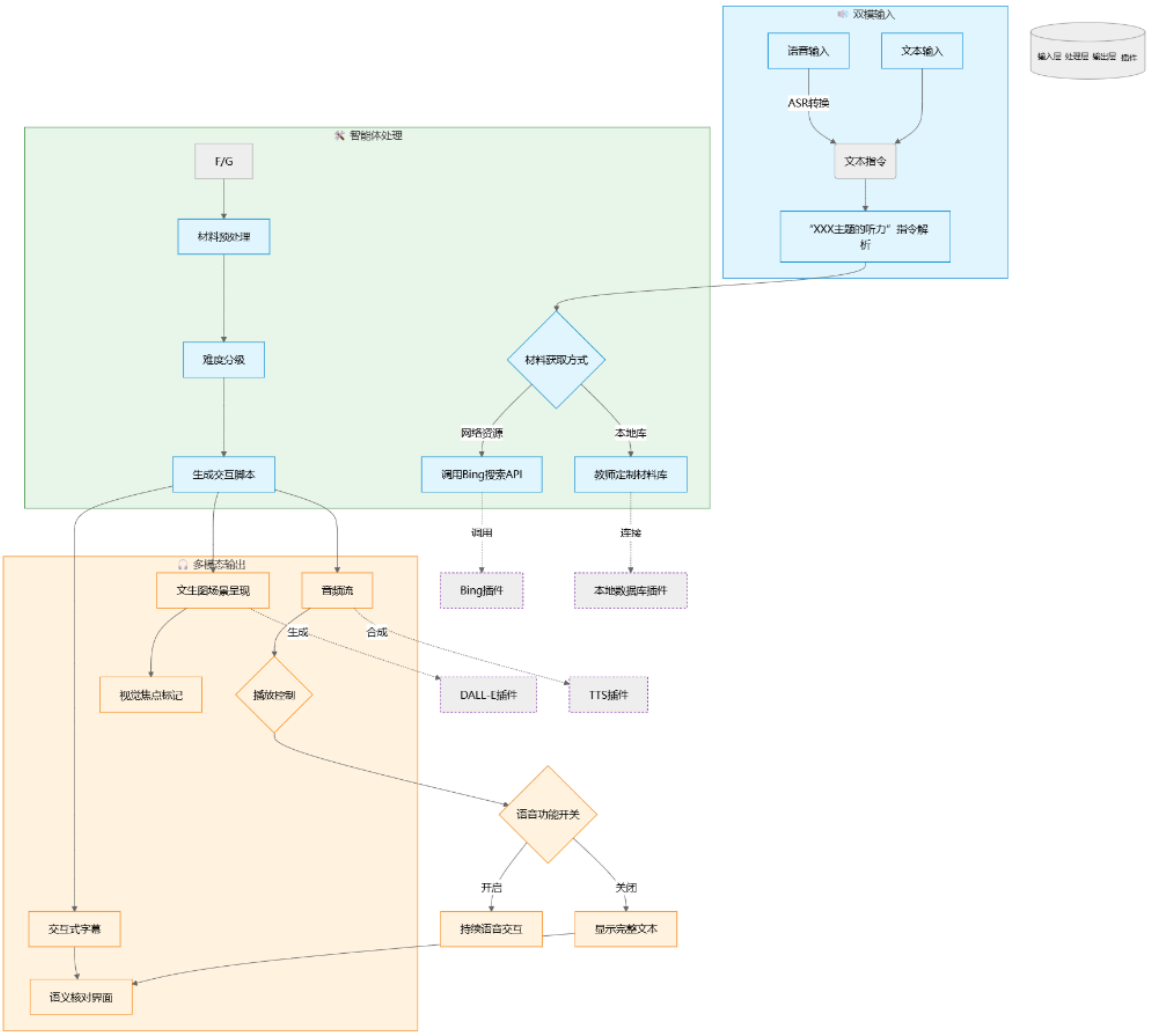

Figure 3: The Design of *Listening Context Application* Agent

Figure 4: The Structure of Invoked Plug-in Workflow in Listening project

2.2.2 A Case of Development of *Genre Writing Application project*.

English writing tasks are usually completed at the end of the lesson, mainly through extracurricular activities. Therefore, the application in which students use the Writing Agent are often process-oriented writing guidance, and the core function should be controlled as “progressive writing prompts”, which ranges from prompts on task responsiveness to coherence, from syntactic accuracy to vocabulary richness to feedback guidance on the writing

process, to the occasion in which students use the Writing Agent independently after the classroom, such as, writing press releases, speeches, product manuals, English blogs, and other multi-classes of discourse style shifts. Considering from the teacher's end, this agent should also have a fixed workflow pattern of multiple multi-batch file (supporting .pdf/.doc/.png and other file types) uploading, identifying and classifying the overall error preferences of all articles, and feeding back to the backend knowledge base.

Feedback_writing workflow model: First, the teacher's end mainly focuses on correction, first uploading students' manuscripts to the Writing agent in batch, identifying the content of students' png and pdf files through the LinkReaderPlugin plug-in, conducting batch error preference analysis and classification, and depositing them into the knowledge base, generating class report dashboards for comprehensive diagnostic analyses. After uploading the documents on the students' side, the steps on the teachers' side are repeated to identify the errors and enter the progressive guidance stage, so as to conduct coherence analysis, grammar checking, vocabulary optimisation and other analyses, and give the corresponding annotated documents. The next time it is used, the updated knowledge base will double-check high-frequency errors and rules to achieve results. The second module on the student's side uses the trigger "type of writing", and the intelligent agent receives this trigger message and opens the module of process guidance for interaction (see Figure 5).

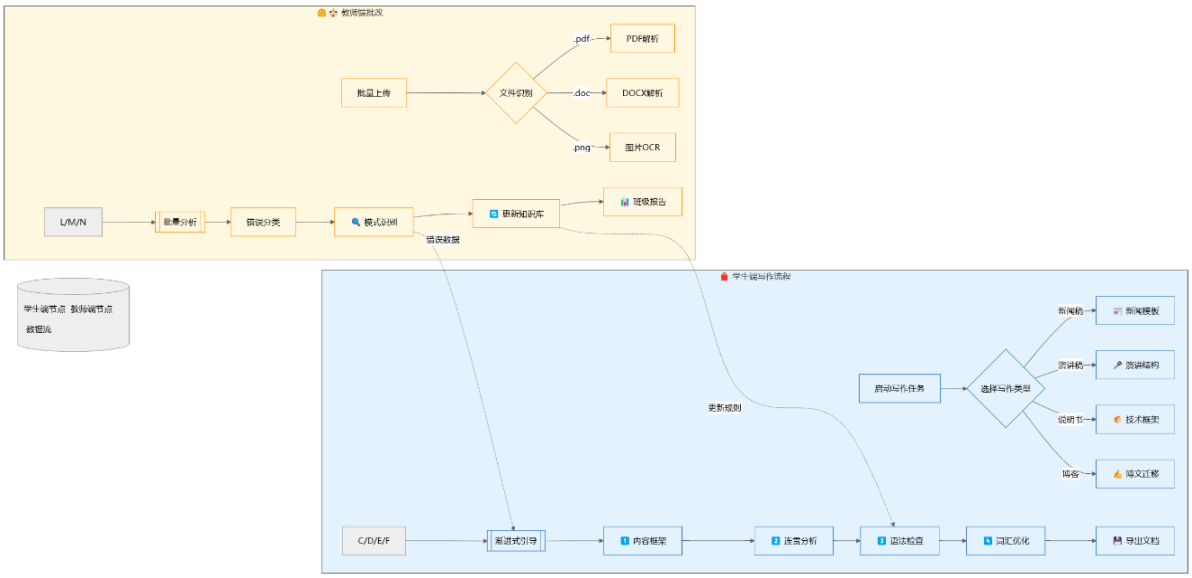

Figure 5: The Design of *Genre Writing Application* Agent

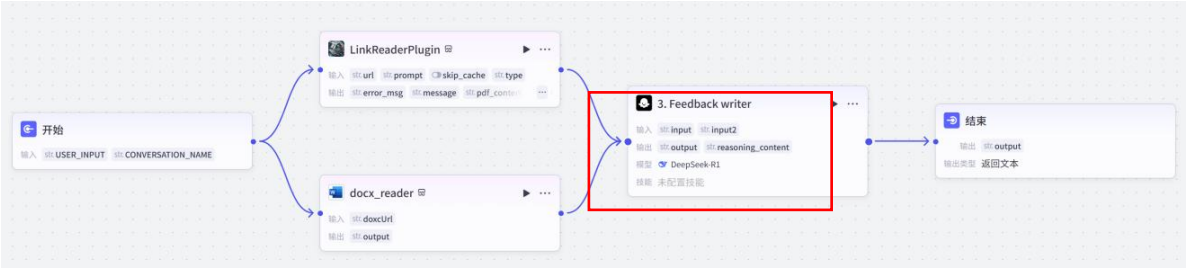

Figure 6: The Structure of Invoked Plug-in Workflow in Writing project

2.2.3 A Case of Development of *Leveling Reading Application project*.

Compared to writing and listening, the English reading AI agents should recommend English books based on students' personalised reading habits, provide legitimised book summaries and synopses (rejecting infringing reading materials), deploy big models through URL reading plug-ins and text visualisation visualizers, invite students to engage in human-computer collaborative dynamic text reconstruction as well as guiding students from reading vocabulary level (shallow) cognition to reading culture dimension (deep) cognition. Its core functions should include: the construction of a hierarchical knowledge base (i.e., using a plug-in with a BERT model to make text complexity-graded recommendations), and the construction of a cultural contextual knowledge map (character relationships - historical events - literary allusions - social customs). To this end, the team designed Leveling_reading to focus on students' extended reading experience outside the classroom.

Leveling_reading Workflow Mode: i. Students can input "English level (primary, intermediate, advanced) to recommend graded reading materials", or they can be matched by the scores of CET4 or CET6/ TEM 4 or TEM 8 for positioning purpose, and the Deepseek-V3 model would be activated. ii. The Deepseek-V3 model has already fitted the scores of many standardised tests, such as CET4 or CET6/ TEM 4 or TEM 8, TOEFL, IELTS, CEFR and China Proficiency Rating Scale (CPRS). Choose your own field of interest or follow the intelligent agent recommended options for topic selection "humanities and history, science fiction, mystery and detective" and so on. Based on the screening, the system will recommend books and profiles suitable for the current language ability for students to choose. At the same time, students can ask the system for the book's mind map and knowledge map, but according to their own needs to analyse the key content selection (character relationships, plot structure, etc.). Accordingly, the Intelligent Agent integrates the content through the TreeMind plug-in and the Volcano Knowledge Base, generating a visual and interactive knowledge map, as well as a complete mind map and a self-defined link for modification, in order to complete the English reading process.

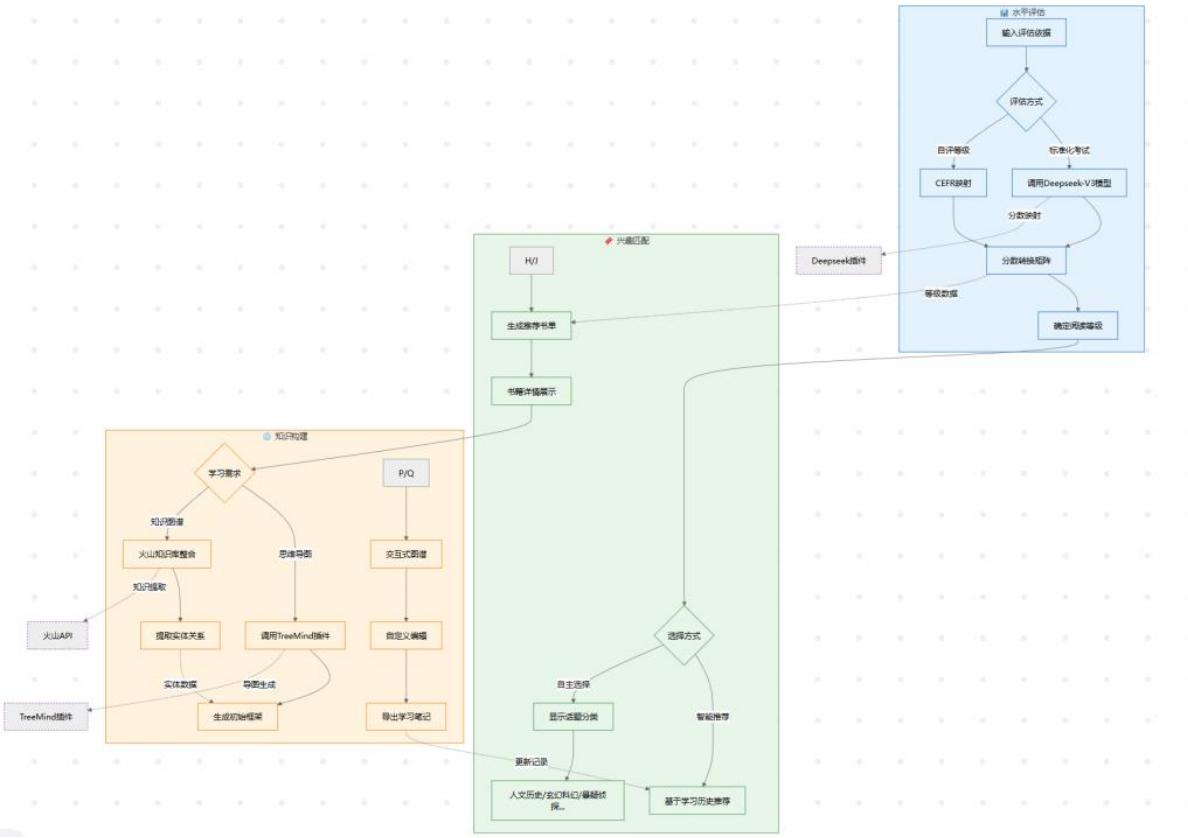

Figure 7: The Design of *Leveling Reading Application* Agent

Figure 8: The Structure of Invoked Plug-in Workflow in reading project

2.2.4 A Case of Development of *Chitchating Speaking Application project*.

As one of the strongest strengths of AI, compared with the traditional speaking classroom, where the teacher's feedback is narrow, the introverted and extroverted personality affects the turn of speech and the fear of being criticised, AI speaking coaching has the advantages of a nonthreatening dialogue environment, selectable accents, and customised topics. AI speaking coach has the advantages of non-threatening dialogue environment, selectable accents, disregarding time and space limitations, customized topics, and one-on-one fine-tuned feedback.

Therefore, the core functions of the Speaking companion agent should include: non-directive error-correcting dialogue feedback and situational dialogue rehearsal as well as intelligent speaking diagnosis. In addition, in order to enhance students' interest and motivation in dialogue, this agent opens the function of long-term memory, sets up the virtual character dialogue points system, and the scoring of students' output content will be based on the character's goodwill as the scoring standard. To this end, the team developed the application of Chitchat_Chirping workflow anchoring students' English Learning English practice virtual classroom intelligibles.

Chitchat_Chirping workflow mode: students access the speaking AI agents by clicking on the Call button, and can customise the parameters (accent, gender, character personality, etc.) prior to practice through dialogue with the AI agents. After the intelligent agent has been set up, it continues to set the difficulty of the dialogue (Beginner-intermediate-advanced levels) and waits for the student to select a topic (if no selection is made for 5 seconds, it will randomly select a topic from the existing topics of the corresponding level), throughout the whole process the agent adjusts itself on the axis of the student's input, and it can discover the user's emotions and the meaning of implications in the language. For students with slight speech impairments, the intelligence chooses to listen rather than interrupt. The process does not have any pause buttons, and the dialogue is carried out in rounds that restore the most realistic communication, so as to alleviate the student's psychological defences and barriers to the maximum extent possible. At the end of the dialogue, the student gives a trigger word such as "feedback", and the intelligent agent calls Deepseek-V3 and its plug-in modules "Audio2Text" and "Speech to Text" to read the audio. to Text" to read the audio and feed it back into text form, and follow the sandwich principle to provide dialogue feedback (text+ speech) to mitigate the student's sense of dialogue threat.

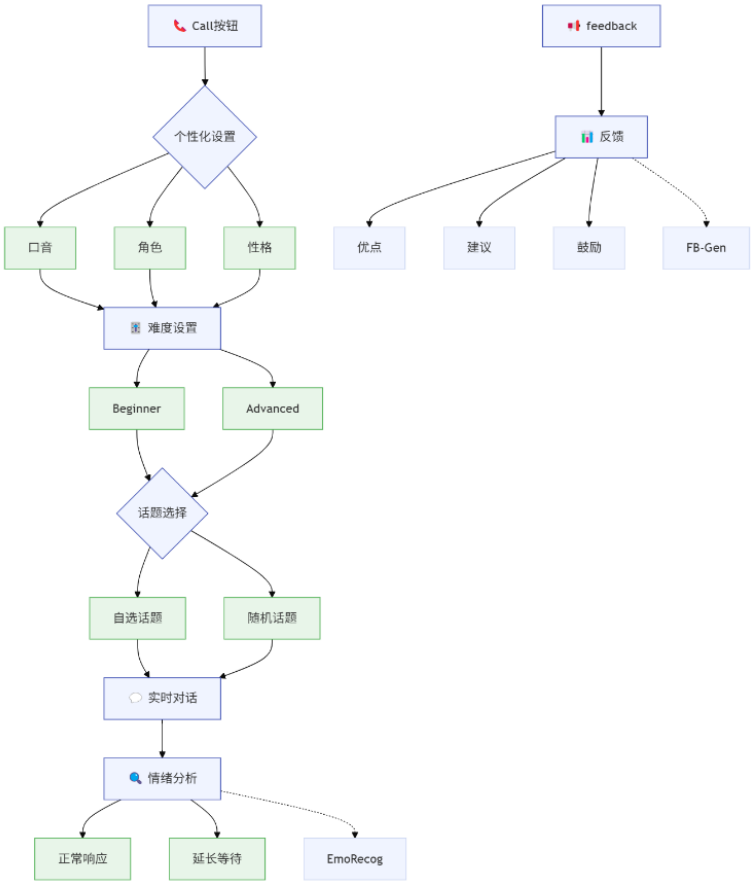

Figure 9: The Design of *Chitchating Speaking Application* Agent

Figure 10: The Structure of Invoked Plug-in Workflow in Speaking project

In addition to the above mentioned listening, reading, writing and listening four agents project development cases, Coze platform also supports the development of API Key and SDK integration to the platform outside the address for use, to a large extent, to expand the multi-AI agent ecological in the extracurricular language learning of the spatial and temporal limitations. The user's use will also retain a copy of the memory in the back-end teacher's end, and the teacher will also be able to grasp the amount of students' extracurricular training tokens and data. In the future, the multi-intelligence agent collaboration mechanism can also be in the form of workstations (now the application of the beta version) for the complete ecological development, data flow interoperability, to create a real third virtual classroom.

Below are links to the four AI agents developed by the team for trial use, and we welcome exchanges and criticisms from scholars.

Link to ***Listening Context Application*** project:
https://www.coze.cn/store/agent/7488619605901672500?bot_id=true
Link to ***Genre Writing Application*** project:
https://www.coze.cn/store/agent/7488549645611106314?bot_id=true
Link to ***Leveling Reading Application*** project:
https://www.coze.cn/store/agent/7488533060380835859?bot_id=true
Link to ***Chitchating Speaking Application*** project:
https://www.coze.cn/store/agent/7485558987653054518?bot_id=true

3. CONCLUSIONS AND OUTLOOK OF THE STUDY

Aiming at the practical pain points of the English Learning efficiency, this study proposes a multi-AI agents collaboration framework based on the low-code Coze platform to explore the innovative path of extracurricular English learning. By integrating Vygotsky's "i+1" language learning theory and distributed cognitive architecture, a dynamic context-generated, knowledge map-driven ecosystem of AI agents is constructed, covering four-dimensional ability training in listening, writing, reading and speaking. On the technical level, relying on the low-code features of Coze platform, we have designed specific application cases such as real-time error correction, progressive writing guidance, and graded reading recommendation, which have significantly improved the efficiency of resource matching and the participation of teachers and students, and provided a landmark technical solution for the intelligent transformation of education.

Research practices have shown that the multi-intelligence collaborative framework can effectively bridge the virtual-reality disconnect and resource fragmentation of the traditional English Learning. Through personalised learning resource matching (e.g. standardised test fitting for graded reading), multi-modal interaction design (voice, text, image collaboration) and low-code tools empowering teachers to develop on their own, it systematically alleviates the limitations of the "one-size-fits-all" teaching model, and promotes the transformation of extracurricular English language learning to immersive and adaptive direction. At the same time, the API integration and multi-end collaboration mechanism of the intelligent agent ecosystem further expands the temporal and spatial boundaries of the learning scenario, laying the foundation for the construction of a "student-centred" language learning community.

Despite the results of the study, there is still a need to deepen the exploration in theory and technology in the future. For example, the mechanism of multi-AI agent collaboration needs to be further improved by combining social constructivism theory, and the specific effect of intelligent bodies on students' ability enhancement needs to be quantified through empirical research. In addition, with the iteration of generative AI technology (e.g., Deepseek-R1 model upgrading), directions such as affective computing enhancement and cross-platform intelligent agent collaboration can be explored to respond to the needs of more complex educational scenarios. Overall, the fusion of low-code and multi-AI agent technologies provides new ideas for the digital transformation of education, and its development potential will continue to be unleashed with technological evolution and ecological improvement.

ACKNOWLEDGEMENTS

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