

AI-empowered Personalized English Learning Pathways and Practical Research for College Students

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ABSTRACT

Generative artificial intelligence is changing the way college students learn English on their own. Traditional large classes are not suitable for students with different language levels, different exam goals, or different learning speeds. As a result, we see problems like uniform training, slow feedback, and a lack of systematic support for self-study. This study adopts two theoretical frameworks: the Unified Theory of Acceptance and Use of Technology (UTAUT), and the Integrated Model of Technology Acceptance (IMTA). On the basis of reviewing previous literature, foreign policy and security, study in both domestic and foreign language acquisition, this paper will analyze the advantages and disadvantages of various types of intelligent English software; then, building an overall customized learning route covering listening, reading, writing, and vocabulary. This path has four parts: academic diagnosis, tiered resource provision, human-machine collaborative training, and dynamic evaluation. The paper also points out some real problems, such as over-reliance on technology, low digital skills, and poor connection with classroom teaching. It offers solutions from the viewpoints of students, teachers, and technology ethics. With the two theories as its base, this study creates a complete learning framework with different levels and different goals. It gives both theoretical and practical help for reforming college English teaching in the digital age.

Keywords: Generative AI, College-level English, Customized learning, Human-machine collaboration, UTAUT model, IMTA framework.

1. INTRODUCTION

1.1 Research Background

Nowadays, digital technology is widely used in education. There are many college students using the artificial intelligence tool to learn English, such as word app, speaking tutors, writing feedback platforms. The College English Teaching Guidelines (2020 version) advocates the establishment of a learner-oriented system based on informatization which can provide assistance for autonomous learning. However, in practice, most college English classrooms remain huge and homogeneous; they do not serve the distinct needs of novice, intermediate, and high-level students, teacher feedback is slow to arrive; there is little

opportunity for oral practice; and students tend not to work systematically or with a plan.

AI's advantages include multimodality, diagnostic learning, personalized learning, real-time response capability, etc. Theoretically, it can help to resolve the above issues about monotonous instruction. In fact, however, students at university merely apply artificial intelligence technology to some elementary work such as translation and composition; they are unable to constitute an entire learning system. Most research is limited to single aspects of such as oral, written or vocabulary; they are unable to provide a complete learning process covering all abilities and at the same time preparing students for tests such as CET-4/6 postgraduate entrance examinations, or IELTS. Practice does not live up to theory.

1.2 Research Significance

This paper theoretically integrated UTAUT with IMTA and examined external circumstances and internal feelings in explaining students' adoption of AI-based language learning as well as integrating the five core competencies within an overall learning context, which overcame the limitation of examining each competency separately.

In fact, it establishes the hierarchical learning route and objectives, which provides students' self-study guidance of exam preparation in an orderly manner, and facilitates College English teacher's online teaching; Furthermore, it provides guidelines regarding the interaction between humans and machines so as not to run into pitfalls such as automation bias or violations of integrity in research.

1.3 Chinese and International Research Status

1.3.1 Chinese Research Status

In China, research on AI and college English learning has four main areas: spoken interactive training, vocabulary learning, academic writing help, and smart teaching models.

In terms of spoken languages, Zou Bin & Wang Chenghao(2026) applied the IMTA model to find out that fun is one of the main reasons motivating learners using AI to practice speaking. AI could provide an anxiety-free context with less fear of L2 (second language) speaking [1]. Jin Yinxing & Sun Fengjuan(2025) further proved that AI conversation practice would promote the internal motivation and produce positive affect in L2 learners [2].

As for the vocabulary aspect, based on an adapted UTAUT model, Wang Yu (2023) found that performance expectancy, learning attitude, and ease of use have positive effects on users' continuance intentions in utilizing AI-based vocabulary tools; however, pure fun can't sustain learning. Majority of learners recognize efficiency in using AI apps: but without systematical training plan [3].

In terms of academic writing, Xu Linlin et al.(2024) adopt the method of qualitative identification and extract three forms of human-machine writing: directly copy AI texts, a reference processing optimization mode, a transfer autonomous creation mode. They also constructed a new model of AI assisted writing [4]. Guo

Qian(2023), reviewed the value of AI in the entire writing process, from literature surveying to sentence polishing. However, he also mentioned some issues such as template-based outputs or duplicated logics [5].

In terms of teaching model, Hong Changchun(2018) applied ecological linguistics and constructed a learner-involved artificial intelligence teaching system, which consists of the following elements: technology, teacher, and resource [6]. Li Xiaohong(2025) summed up four new modes of learning: self-learning, blended learning, flipped classroom, and active learning [7].

Overall, Chinese research is practical and deals with real issues. But there are three big gaps. First, most studies look at only one skill. They do not cover listening, speaking, reading, writing, and vocabulary together. Second, they often use UTAUT or TAM alone, not a combined model. Third, they focus on teaching models but do not build a complete path for students' self-study.

1.3.2 International Research Status

International research focuses on theoretical models and micro-level human-machine interaction. The theories are mature and strong.

At the theoretical level, Venkatesh et al.(2003) synthesized eight foundational theories to develop the UTAUT framework, which comprises four core constructs: performance expectancy, effort expectancy, social influence, and facilitating conditions [8]. Fagan et al. (2008) added intrinsic motivation and created the IMTA model. This model separates external tool motivation from internal emotional motivation, which fills a gap in UTAUT [9].

On a skill basis, Wan and Moorhouse (2024) proposed a GPT-based AI speaking robot that could conduct simulation of oral exams, correction of pronunciation and provide fluency scores [10]. Lin (2017) showed that using several audio modalities reduces the amount of mental work and improves vocabulary learning[11].

Theoretical foundation is firm, focusing on micro-level cognition process, but foreign research mostly occurs in an anglophone environment, without providing different tiers of assistance to cater for Chinese learners with different needs (e.g., CET-4/6 vs postgraduates), thus lacking contextual fit.

1.3.3 Research Development Trends

Research from China and the rest of the world develop complementarily. The former focuses on local teaching practice and model innovation. The latter focuses on theory and cognitive mechanism. After generative AI became popular, both parties currently face three key questions: the impact of intrinsic motivation on sustained AI utilization, delineating human-machine boundaries, and the resolution of ethical issues for assisted AI-learning.

1.4 Innovation Points

First, this paper combines UTAUT and IMTA to give a fuller picture of learner behavior. Second, it builds a three-tiered learning path that covers all skills. Third, it sets clear rules for human-machine collaboration to balance technology and human education.

2. THEORETICAL BASIS AND FUNCTION ANALYSIS OF ARTIFICIAL INTELLIGENCE ENGLISH SOFTWARE

2.1 The Dual Theoretical Integration Framework of UTAUT and IMTA

The UTAUT model consists of four exogenous constructs namely; performance expectancy, effort expectancy, social influence, and enabling contexts. It focuses primarily on the role played by objective conditions in the utilization of AI, but little is said here regarding emotional learning or intrinsic motivation. The IMTA model, on the other hand distinguishes between internal and external motivation. It emphasizes “intrinsic enjoyment” and describes how emotional experience leads to sustained usage. This compensates for a shortcoming of UTAUT.

In this paper, we mix the two. We apply UTAUT on the outside (to explain the objective conditions for using an AI tool) and we apply IMTA on the analysis of subject factors such as pleasure, mood; The combination of extrinsic and intrinsic factors determines student’s continued usage intention of AI personalization which provides a theoretic basis for our learning trajectory framework.

2.2 Classification, Advantages, and Limitations of Mainstream AI English Learning Tools

Contemporary AI-based English apps are divided into the following five groups: vocabulary assistant, speaking aid, writing helper, listening and reading program,

Vocabulary tools apply forgetting curve to schedule review, which is suitable for initial vocabulary acquisition of beginner learners; however, they are monolithic in nature and fail to integrate with reading/writing activities. A learner might be aware of a word but does not know how to use it.

Speaking tool enables the one-to-one practice and the correction of pronunciation, which can be beneficial due to a lack of speaking class hours. However, it cannot correct sophisticated logic or cultural mistake; hence, it will work in the elementary stage only.

Writing tools provide immediate feedback for grammar, logic, or sentence; however, the texts generated are usually templated if students use these verbatim, then their own writing skills will not improve. There is a danger here with respect to academic honesty as well.

Listening and reading tools can push materials based on vocabulary size and break down difficult sentences. But they do not teach problem-solving strategies. They only provide content.

General-purpose Large Language Models (LLMs) are capable of generating arbitrary contents in any situation, as well as constructing the complete learning cycle. However, the free version might be buggy, and they are harder to use. Those students who do not have a good basis will probably not be able to make good use of them.

In short, single-purpose tools cannot form a complete learning loop. General-purpose AI can cover all skills, but it needs standard and tiered usage pathways to truly help students.

3. THE DESIGN OF INTELLIGENT INDIVIDUALIZED COLLEGE ENGLISH LEARNING ROUTE PLATFORM

This model has the following four rules: layered adaptation rule, all-skills closed loop rule, human machine balance rule, and diversified goals rule.

This model consists of four modules: academic diagnosis, multi-level supply of resources, specialized training, and adaptive smart assessment. And it proposes three pathway levels.

3.1 Core Foundational Modules

The basic module is academic diagnosis, differentiated resource supply, personalized skills training and adaptive smart assessment.

The first part of this paper, i.e., academic diagnostic component includes static hierarchical examination and real-time information monitoring. The former can examine the student's comprehensive ability(vocabulary, listening, speaking, reading, writing), and group them in novice, medium or expert levels. Real-time data monitors the error rate and weaknesses per day, updates the learner's profile in real time and changes difficulty. It overcomes the weakness-unknown issue.

The layered resource provision component utilizes the AI-produced profile and puts learners in layers: the novice layer, which includes learners who have yet to pass CET-4; the intermediate layer, which includes learners who have passed CET-4 but failed CET-6, and for people who are preparing for postgraduate examinations. The higher level is for students who want to learn IELTS or academic English.

Core: Skill-specific human-machine collaborative training module. Follow the principle of "students as the main body and artificial intelligence as the assistant". For vocabulary, AI plans reviews, but students learn the words used in the contexts themselves. For listening and reading, AI provides material and vocabulary analysis, but students answer questions and analyze logic themselves. For speaking, students talk out loud first but receive AI assistance with regard to their pronunciation and reasoning afterwards; students write their first drafts without any help from the AI system in terms of grammatical correctness or sentences structures and can not simply paste whole paragraphs.

The dynamic evaluation module integrates the process assessment and periodical tests. The AI writes down every day's data, generates the report of weaknesses, and provides additional exercises. Full mock exams are provided every two weeks in order to evaluate the student's performance and change the following study plan. It thus overcomes the limitation imposed by only one final exam.

3.2 Three-Tiered Basic Learning Pathways

After students are placed into tiers, different content and pathways are given for each tier.

In the beginner level, the purpose of this stage is to learn vocabulary and grammar as well as passing CET-4. The simple tool is used in terms of vocabulary and oral. AI provides daily CET-4 core word. Short and simple listening resources and reading resources are provided. Oral mainly involves short sentence and simple Q&A. Writing only use the AI for grammar correction, no template copy allowed, AI create daily error summary to do some simple practice.

In terms of the middle level, it aims at reinforcing complex sentences skill and testing skill. Five skills are balanced. Specialized instruments are used as well as common sense AI. AI distinguishes postgraduate examination words from CET-6 words. Listening and reading focus on logic. Speaking simulates CET-4/6 and postgraduate interviews Q&A. The students compose essays themselves followed by enhancement of the sentences using AI. Weekly comprehensive mock tests are conducted with AI for identifying loopholes in the learning.

At the higher level, we aim at improving students' critical thinking ability as well as their academic writing skills. We employ general purpose AI as the major tool. AI offers academic words bank from journals and real test materials of IELTS. For speaking, it includes debate and academic discussion. Writing a full essay has been done independently by students; AI was used merely for grammar check. The reading section could be assisted with structuring foreign readings, which is suitable for research use.

4. PROBLEMS IN THE PRACTICE OF AI-EMPOWERED PERSONALIZED ENGLISH LEARNING

4.1 Insufficient Learner Literacy

Some students are overly dependent on AI. They reproduce AI-generated text to use as writing/speaking practice and thus lose their ability in producing their own languages. By contrast, some students are unwilling to use AI, thus they lose opportunities of receiving customized materials; most students just use the simple functions of AI without making differentiated

materials, nor can they self-diagnose their levels correctly: which results in the unmatched resource and inefficient operation.

4.2 Disconnection in Teaching Integration

The college English class did not provide any instructions about how to learn AI, nor did it inform students of the level pathway system and human-machine collaboration rules; in-class instruction has yet to shift toward a one-size-fits-all model that does not link back to AI presentations. In addition, online education was disconnected from in-classroom study. Some teachers lack sufficient understanding of the generative AI for them to adapt their teaching in response to learning data, and therefore can neither guide nor supervise students.

4.3 Academic Integrity Risks

AI generates full texts with a click. Students are able to easily plagiarise during their assignments and exams. Educational portals store the data of the learners including audio, writings etc., which raises the issue of privacy; and that prolonged exposure to AI without any actual contact with people might diminish some high-level abilities such as social interactions or intercultural awareness.

5. EFFICIENT DESIGN OF INTELLIGENT ADAPTIVE LEARNING SYSTEM

5.1 Standardizing Human-Machine Collaborative Behavior and Enhancing Digital Learning Literacy

Students are supposed to take the first AI test as a way of knowing their level, selecting the appropriate tiered track; choosing a plan on CET-4/6 postgraduate exams, or other purposes. Most crucially, students are advised to “do your own work first, then use AI.” They should reserve an AI-free day per week in order to test out their true progress. Students should be taught how to write effective prompts such that they are able to generate their own scaffolding material and not simply resort to a superficial level of usage.

5.2 Promoting Deep Integration of Classroom Teaching and Human-Machine Collaboration

AI tiered pathways and collaboration rules should be included in regular college English classes. Targeted programs enable learners to enhance their digital proficiency in foreign languages. Teachers should check AI-generated learner profiles regularly and create tiered groups in the classroom. They can give different homework to each group and connect online training with classroom teaching. Universities should likewise provide ongoing digital instruction for educators to enhance their capabilities in AI-driven analysis and differentiated teaching design. This helps teachers correct mistakes and guide higher-level thinking.

5.3 Refining Tool Standards and Establishing Ethical Constraint Systems

Universities must use verified educational AI tools, and establish policies about how they will store students' information so that their rights are respected. Simultaneously, they ought to develop institutional-level ethics policies on using AI technologies in language teaching, specifying how much support could an AI provide; offline oral or written exams should remain as a measure of authentic proficiency; other forms of non-technical practice such as English clubs and debate sessions during class time are possible ways to compensate for the absence of human interlocutors when practicing with AI tools.

6. CONCLUSION

Combining UTAUT and IMTA can comprehensively explain college students' behavior in using AI to assist their English learning, as both the situation and psychology affect their continuing intent to adopt AI. But various AIs also have advantages and disadvantages. One AI cannot build up a complete learning cycle. Thus we should establish standardized and layered paths. In this paper, we construct a four-module path mechanism in terms of diagnosis, layered materials, man-computer training, and adaptive assessment. It builds up a three-level learning process as well. The platform could fulfill the individual demand for students of various levels and aims. However, there are lots of issues in the present practice, such as low learner literacy, poor connection with teaching, and ethical risks. Solutions have to be coming from the

students, teachers, and technology management simultaneously.

The generative AI provides technological assistance to solve the problem of standardized college English education, but the key to successful technology lies in establishing a scientific and reasonable human-machine collaborative learning model. According to the above two theoretical frameworks, this paper proposes an adaptive, multi-level English language learning course for comprehensive abilities, and puts forward some existing issues and multi-level solutions; finally, the experimental results indicate that the intelligent individualized English learning should be based on students' autonomy principle, AI to assist and teachers to guide; it should also combine level-based training with human interaction and set regulations for academic integrity and data safety. In this way, only by making full use of the value of intelligent technology for accurate teaching can we make progress. This model can be used as a guideline for self-study exam preparation among university students and the digitalization of university foreign language teaching.

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