

Generative AI and Differentiated Instruction in Private Undergraduate English Education: Implementation Pathways and a Conceptual Framework

Shu Shen, Lijuan Shen*

School of Foreign Languages, Xiamen Institute of Technology, Xiamen 361021, China

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Abstract

The rapid diffusion of generative artificial intelligence (GenAI) has reopened an old question in language pedagogy: how to teach heterogeneous classrooms without leaving slower or more advanced learners behind. In the Chinese private undergraduate sector, non-English majors often enter with uneven proficiency while large class sizes constrain individual attention, so the traditional ideal of teaching according to aptitude has remained more aspiration than routine practice. This paper argues that GenAI, used deliberately, can operationalize differentiated instruction at scale. Drawing on Tomlinson's differentiation framework, Vygotsky's zone of proximal development, and technology-acceptance theory, the paper develops a conceptual model and proposes six implementation pathways: diagnostic profiling, AI-generated tiered materials, personalized feedback, learner choice in products, teacher role reconfiguration, and integrity safeguards. The analysis situates each pathway within the constraints of private undergraduate institutions and connects it to the conditions under which differentiated judgment is preserved rather than displaced. The paper concludes by discussing the theoretical implications of framing GenAI as an engine for teacher-led differentiation and by outlining the propositions that future empirical work should test.

Keywords: Generative Ai, Differentiated Instruction, Teaching According to Aptitude, College English, Private Undergraduate Institutions, China

Introduction

The arrival of publicly accessible generative AI has changed what is technically feasible in the English as a Foreign Language (EFL) classroom more quickly than most teacher-education programmes have been able to absorb. Tools such as ChatGPT, and in the Chinese context Wenxin Yiyan (ERNIE Bot), Tongyi Qianwen, Kimi, and DeepSeek, can draft texts, explain grammar, simulate conversation, and return feedback within seconds (Kohnke et al., 2023; Sun et al., 2025). For many teachers this is less a tidy new resource than a disruption of established routines around writing, assessment, and authorship itself (Hockly, 2023). The

transformative potential of such tools for education has been argued forcefully (Adiguzel et al., 2023).

Beneath the novelty sits a longstanding pedagogical problem. Chinese private undergraduate colleges face the challenge of supporting students with differing English learning needs, with studies in private college contexts documenting lower-and intermediate-proficiency learners and examining approaches to language support (Cai & Ramanair, 2026; Wang & Chen, 2024). The classical Chinese educational ideal of teaching according to aptitude — instruction responsive to each learner's readiness and interests — calls for in practice it has been difficult to realise when one teacher faces fifty or more students (Saban & Atay, 2023; Tomlinson, 1999). GenAI does not dissolve that constraint by itself, yet its capacity to generate and regrade material on demand makes fine-grained differentiation more tractable than it was even three years ago.

Surprisingly little conceptual work has examined this possibility in the specific setting of Chinese private universities. Sun et al. (2025) showed that non-English majors in four private Chinese universities hold a clear, motivationally grounded intention to use GenAI chatbots for English learning, but their study stopped at intention and did not articulate how such intention could be converted into differentiated classroom practice. Other recent Chinese cases, such as Li et al. (2026) at Qingdao City College, demonstrate promising blended frameworks but remain single-site illustrations rather than transferable models. The present paper therefore pursues two aims: (a) to construct the implementation pathways through which GenAI can support differentiated college-English instruction in a private undergraduate context, and (b) to specify the theoretical conditions and safeguards under which such differentiation is likely to succeed.

Literature Review

Generative AI in language education

Scholarly attention has moved from whether AI belongs in language teaching to how it should be integrated. Systematic reviews converged on a consistent picture: GenAI supplies personalized feedback, sustains learner autonomy, and raises engagement, while also introducing risks of over-reliance, academic dishonesty, and skill atrophy (Al-khresheh, 2024; Crompton & Burke, 2023; Zawacki-Richter et al., 2019). Earlier literature reviews had already flagged personalization as a persistent theme in AI-assisted language learning (Zhang & Aslan, 2021), and bibliometric work identifies personalized systems among the most established AI applications in the field (Huang et al., 2023). Within EFL, conversational agents have been shown to support pre-writing strategy use and affective engagement (Nguyen et al., 2025), to improve English for Specific Purposes writing across gender and discipline groups (Jmaiel et al., 2025), and to strengthen speaking confidence through AI-mediated interaction (Fathi et al., 2024). Reviews focused on the EFL context stress both empowerment and caution (Jiang, 2022; Kohnke et al., 2023).

Theorists frame these tools less as replacements for teachers than as new "spaces" for language use. Godwin-Jones (2023) describes AI bots as ambient interlocutors that extend the environments in which learners can practise; Kohnke et al. (2023) emphasise the digital competencies teachers and learners need to deploy them ethically. Hockly (2023) cautions that the same capacities bring "bad and ugly" dimensions: bias, inaccuracy, and integrity

threats. Ji et al. (2023), in a systematic review of conversational AI, argue that the productive unit is the human-AI partnership rather than the tool alone. This partnership lens is central to the present paper.

Differentiated Instruction and the Ideal of Teaching According to Aptitude

Differentiated instruction, as developed by Tomlinson (1999; Tomlinson & Imbeau, 2010), asks teachers to vary content, process, product, and learning environment in response to learners' readiness, interests, and profiles, without lowering the standard. It is conceptually close to the Chinese notion of teaching according to aptitude, an ideal with roots in Confucian pedagogy that insists instruction meet learners where they are (Saban & Atay, 2023). Vygotsky's (1978) zone of proximal development supplies the developmental rationale: learners progress most when supported at the edge of their current capability, a condition that differentiated scaffolding is meant to provide.

Empirical work on differentiation in higher-education EFL remains thin. Saban and Atay (2023) found that Turkish preparatory-program instructors differentiated most readily by learning environment and by readiness, less so by product or interest, suggesting that even willing teachers struggle to operationalise the fuller model under normal constraints. GenAI's ability to mass-produce level-appropriate variants may lower exactly this barrier.

The Private Undergraduate Context in China

Private undergraduate institutions occupy a distinctive niche in China's higher-education system. Tuition-dependent and often newer than their public counterparts, many admit students whose English scores fall below the public-university median and who carry what Sun et al. (2025) describe as weaker proficiency, exam-oriented habits, and lower intrinsic interest. These are precisely the learners for whom uniform delivery fails first. Recent Chinese scholarship has begun to propose AI-human collaborative ecosystems (Meng, 2026) and GenAI-blended reading-writing frameworks (Li et al., 2026) for exactly this population, but effect evidence is still emerging.

Theoretical Framework

The study integrates three strands. First, Tomlinson's (1999) differentiation model supplies the curricular axes — content, process, product, and environment — along which GenAI can act. Second, Vygotsky's (1978) zone of proximal development justifies just-in-time, individually calibrated scaffolding: a GenAI tutor that adjusts task difficulty to observed performance is, in effect, an automated scaffolding agent. Third, acceptance theory explains uptake. Davis's (1989) technology-acceptance model, with its constructs of perceived usefulness and perceived ease of use, and Gardner's (1985) distinction between instrumental and integrative motivation, help account for why some learners adopt GenAI assistance and others resist it. Sun et al. (2025) found instrumental motivation the stronger driver among Chinese private-university students, a finding that shapes the implementation design below.

Implementation Pathways

The framework operationalises differentiation through six pathways, each mapped onto Tomlinson's (1999) axes and onto the private-university constraints described above. The pathways are presented as a design space: institutions can assemble them context-specifically rather than adopt them wholesale.

Diagnostic Profiling

At the start of a term, each student would complete a placement task and a brief motivation questionnaire. Rather than sorting learners into fixed tracks, the instructor would use the results to seed an individual profile — entry level, recurrent error patterns, and stated goals — that informs subsequent AI prompts. Diagnostic information would be revisited after each unit so groupings stay responsive instead of rigid.

Ai-Generated Tiered Materials (Content)

For each unit, the teacher would generate three difficulty tiers of the same core input, for example a reading passage and its companion exercises, using a domestic GenAI tool. All tiers would target the same curricular standard; only the linguistic load and scaffolding would differ. Students would work primarily at their diagnosed tier but could move between tiers as confidence grew, an arrangement difficult to maintain without automated generation.

Personalized Feedback Loops (Process)

Writing drafts would be submitted first to a GenAI assistant configured to give metalinguistic, not merely corrective, feedback. The teacher would then review a sample and hold short conferences, preserving the human judgment that algorithms cannot supply. Speaking practice would use AI role-play partners for low-stakes repetition, freeing class time for higher-order tasks.

Learner Choice in Products (Product)

Students would select from assessment formats, a recorded presentation, a written essay, or a multimodal poster, according to their strengths, within a common rubric. GenAI would help weaker students outline and rehearse whichever format they chose, supporting equity of access rather than lowering expectation.

Teacher Role Reconfiguration (Environment)

The instructor would shift from sole content provider to designer of AI prompts, interpreter of AI output, and mentor on academic integrity. This mirrors Kohnke et al.'s (2023) call for explicit teacher digital competencies and addresses the "workshop-style" ambiguity that differentiation can introduce (Saban & Atay, 2023).

Integrity and Equity Safeguards

To counter over-reliance and plagiarism, the course would require students to keep prompt logs, to disclose AI use, and to complete at least one unassisted in-class task per unit. Devices and accounts would be provided where needed to reduce the digital divide noted by Al-khresheh (2024).

Discussion

The conceptual model proposed here suggests that GenAI can make Tomlinson's (1999) differentiation model operational in settings where it has historically stalled. The writing-related gains reported by Jmaiel et al. (2025) and the affective engagement documented by Nguyen et al. (2025) are consistent with the pathways developed above, and the present contribution is to embed them within an explicit teaching according to aptitude framing and a private-university context that prior work under-represents. The motivation argument also echoes Sun et al. (2025): when students experience GenAI as useful and easy,

intention and engagement are more likely to follow, which the framework treats as a precondition for differentiated uptake rather than an outcome to be measured here.

Two caveats shape the model. Over-reliance remains a live risk even with integrity safeguards, and the teacher's interpretive role is treated here as indispensable: AI feedback still requires human calibration, as Kohnke et al. (2023) and Ji et al. (2023) caution. Because the paper is conceptual rather than empirical, its claims are propositions about mechanism, not verified effects; the framework therefore specifies the conditions — diagnostic responsiveness, teacher re-skilling, and equity of access — under which the anticipated benefits would be expected to materialise.

For private undergraduate colleges, the principal implication is that GenAI is most valuable not as an autonomous tutor but as an engine for teacher-led differentiation: it absorbs the repetitive generation and first-pass feedback that make individualisation expensive, while the teacher retains responsibility for judgment, ethics, and relationship. The six pathways are offered as a design space from which institutions can assemble context-specific practices rather than as a fixed prescription.

Conclusion

GenAI will not, by itself, realise teaching according to aptitude in China's private undergraduate English classrooms. It can, however, remove a key obstacle — the cost of producing and regrading level-appropriate material — and thereby make differentiated instruction sustainable at scale. The six pathways proposed here offer a concrete conceptual starting point, and the framework anticipates benefits for writing, speaking, and motivation that remain to be confirmed by empirical study. Future research should test the model across institutions and disciplines, track longitudinal effects on independent writing competence, and examine how teacher AI-literacy training mediates student outcomes.

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