International Journal of Arts and Social Science www.ijassjournal.com
ISSN: 2581-7922,
Volume 8 Issue 12, December 2025

Innovation of the "Academic English Reading and Writing" Course Under Digital-Intelligence Teaching Reform

Cheng YU
College of Foreign Languages/ University of Shanghai for Science and Technology, China

ABSTRACT : *This study examines the digital-intelligence reform of the "Academic English Reading and Writing" course and its impact on enhancing students' academic literacy. By integrating AI-supported learning tools, blended teaching modes, and virtual academic communication environments, the course strengthens students' abilities in academic reading, writing, and scholarly exchange. A three-stage model—online preparation, in-class discussion, and post-class human–AI interaction—supports personalized learning and continuous improvement. Results show enhanced student engagement, improved writing quality, and greater teaching efficiency, while also promoting broader academic resource sharing. The findings demonstrate the effectiveness of digital-intelligence technologies in modernizing academic English instruction and offer a replicable model for future curriculum innovation.*

KEYWORDS - *digital-intelligence teaching reform, academic English, AI-assisted tools, higher education innovation*

I. INTRODUCTION

With the rapid acceleration of globalization and the growing intensity of international academic exchange, linguistic competence has become an increasingly vital component of scholarly participation. Across numerous disciplines, English has become the primary medium for communicating research findings, facilitating international collaboration, and participating in the global scholarly community (Gurney, 2016). In particular, proficiency in Academic English has emerged as a key prerequisite for engaging with global academic communities, accessing cutting-edge research, and contributing to international discourse. Within this context, the role of Academic English education in universities has expanded substantially, evolving from a supplementary skill-training component to a central part of cultivating students' academic literacy, research capabilities, and cross-cultural communication skills. Such courses preserve the sophisticated nature of academic discourse by incorporating specialized terminology, disciplinary conventions, and characteristic rhetorical structures (Yunita and Pratiwi, 2017).

However, despite the rising importance of Academic English education, traditional teaching models still face a series of persistent challenges that significantly restrict their ability to meet current pedagogical needs. First, students typically exhibit substantial discrepancies in their English proficiency levels, disciplinary backgrounds, and academic writing experiences. The conventional "one-size-fits-all" instructional approach often fails to accommodate these diverse needs, resulting in uneven learning outcomes (Hyland, 2019). Second, traditional teaching methods frequently remain detached from authentic academic environments. Students may learn linguistic forms and rhetorical structures in isolation, but they are rarely placed in realistic academic scenarios where they can practice scholarly communication, engage with disciplinary discourse, or participate in academic

dialogue. This disconnect weakens the applicability and transferability of what they learn. A third challenge lies in the inefficiency of feedback mechanisms. In traditional settings, instructors often devote significant time to manually reviewing essays and research papers, and students must wait extended periods before receiving feedback. Such delays impede the iterative nature of academic writing, making it difficult for students to revise their work in a timely and informed manner. Moreover, the feedback students receive is often static and limited, lacking the dynamic guidance needed to support continuous improvement. These obstacles collectively hinder the development of students' academic writing competence, critical thinking, and broader scholarly literacy.

In light of these challenges, recent years have witnessed an upsurge of scholarly and pedagogical interest in exploring how modern educational technologies can transform and enrich the teaching of Academic English. Digital-intelligent pedagogy presents opportunities not merely to supplement traditional methods but to fundamentally reshape the instructional paradigm. These advances enable educators to deliver personalized instruction by tailoring learning activities to each student's needs and preferred learning styles (Kharchenko et al., 2024). For example, data-driven analytics enable teachers to track students' progress continuously, identify specific areas of weakness, and offer more personalized and precise pedagogical interventions. Furthermore, the integration of virtual simulation technologies has emerged as a particularly promising innovation. By constructing immersive, high-fidelity academic environments, virtual simulation tools allow students to experience realistic scholarly practices such as academic conferences, research presentations, poster sessions, and peer-review discussions. These simulated academic scenarios help students become familiar with disciplinary conventions, communication norms, and multimodal presentation skills, thereby enhancing their ability to function effectively in real academic contexts. AI-assisted writing tools constitute another important development in this digital-intelligent ecosystem. Generative AI tools offer an interactive learning experience and deliver instant, personalized feedback to learners' inputs, thereby supporting the development of their knowledge and language proficiency (Binu, 2024). They help students refine their writing more efficiently, encourage iterative revision, and significantly reduce teachers' workload. The availability of real-time feedback effectively addresses one of the major limitations of traditional pedagogy, while fostering a more autonomous, self-regulated learning environment.

Current research findings provide substantial theoretical support and practical evidence for advancing digital-intelligent reform in Academic English reading and writing courses. By integrating data-driven instruction, technological empowerment, adaptive learning mechanisms, and virtual simulation environments, digital-intelligent teaching offers a more dynamic, interactive, and learner-centered model. This integrated approach not only enhances the efficiency and effectiveness of Academic English learning but also contributes to the holistic development of students' academic competencies, including critical reading, analytical thinking, creative inquiry, and scholarly communication. Ultimately, the digital-intelligent transformation of Academic English education represents not merely a technological upgrade but a profound pedagogical innovation. It opens new pathways for reimagining course design, assessment practices, and teaching methodologies. At the same time, it provides a forward-looking blueprint for cultivating globally competent scholars capable of navigating the complex demands of contemporary academic life. As such, the ongoing exploration and refinement of digital-intelligent approaches hold considerable promise for the future development of Academic English education in China and beyond.

II. COURSE OBJECTIVES AND STRUCTURAL COMPONENTS

Under the framework of China's digital-intelligence teaching reform, the "Academic English Reading and Writing" course at the University of Shanghai for Science and Technology (USST) has undergone significant innovation in both pedagogical philosophy and instructional design. Guided by the philosophy of student-centered learning, process-oriented assessment, and data-driven precision instruction, the reform integrates big data technologies and artificial intelligence into the teaching environment and seeks to enhance students' academic literacy through a technologically empowered curriculum. This digital-intelligence approach provides a comprehensive learning ecosystem that supports autonomous learning, personalized instruction, intelligent assessment, and immersive academic simulation.

At the heart of this reform is the adoption of the "Zhihuishu" learning platform, which enables students to conduct pre-class autonomous learning activities, including vocabulary assessment and discipline-specific academic reading tasks. These learning processes generate a range of data indicators that allow instructors to monitor students' progress and adjust their pedagogical strategies accordingly. By responding to learners' actual performance and difficulties, teachers are able to deliver more accurate, individualized, and differentiated instruction. Complementing these efforts, AI-assisted writing tools have been integrated into the classroom to address the longstanding challenges of delayed and static feedback in traditional academic writing instruction. These tools analyze student writing in real time and offer targeted suggestions on language use, cohesion, rhetorical structure, and argument development, thereby supporting iterative revision and helping students cultivate greater clarity and rigor in their academic expression. The course also adopts a blended instructional model, combining online resources with face-to-face teaching to create an interactive, flexible, and student-centered learning environment. Multimedia materials, online discussion platforms, and digital collaborative tools are used to stimulate student engagement, enhance classroom interaction, and facilitate personalized learning support. An additional innovation is the introduction of a virtual-simulation academic conference, which provides students with an immersive environment in which they can practice research presentations, participate in simulated panel discussions, and experience international academic communication firsthand. This simulation not only strengthens students' oral academic communication skills but also expands their cross-cultural competence and prepares them for participation in real academic settings.

Structurally, the course consists of two interrelated components: academic reading and academic writing. The reading component is discipline-oriented and spans ten major fields in science and engineering, including computer science, materials science, aerospace engineering, neuroscience, biomedical engineering, transportation engineering, environmental engineering, energy engineering, management science and engineering, and mechanical engineering. By engaging with both foundational literature and frontier research in these areas, students develop a deeper understanding of disciplinary discourse while simultaneously enhancing their ability to extract key information, identify core arguments, and analyze methodological approaches. This exposure broadens their academic horizons and equips them with discipline-specific vocabulary and genre conventions, which are essential prerequisites for advanced academic work.

The writing component follows the full trajectory of academic paper production—ranging from topic formulation and literature retrieval to introduction writing, literature review synthesis, methodological description, results reporting, discussion, and abstract writing. Instruction emphasizes both the rhetorical structure of academic texts and the research-oriented skills required for producing them. Students learn to conduct effective literature searches, refine research questions, organize sources, and present their arguments in a coherent and academically appropriate format. With the assistance of AI-based feedback systems, they receive immediate guidance that allows them to revise their drafts continuously and improve the overall quality of their academic writing. This iterative process strengthens not only their linguistic competence but also their critical thinking, research literacy, and academic integrity.

Overall, the course aims to cultivate students' ability to use English for academic purposes in authentic disciplinary contexts, enabling them to access scholarly frontiers, conduct independent research, and communicate their findings effectively. The integration of interdisciplinary content, technology-enhanced learning, and academic ethics education reflects a commitment to developing well-rounded talents with global vision, innovative thinking, and strong research potential. By fostering autonomous learning, strengthening academic literacy, and enhancing students' capacity for international academic communication, the reformed course contributes meaningfully to the broader goal of preparing students to participate confidently and competently in the global academic community.

III. COURSE IMPLEMENTATION AND SPECIFIC MEASURES

The implementation of digital-intelligence-enhanced pedagogical strategies within Academic English instruction constitutes a systematic and multilayered reform designed to cultivate students' scholarly

competencies and facilitate their transformation into self-regulated, critically engaged participants in academic discourse communities. As higher education increasingly embraces data-driven management, ubiquitous learning ecosystems, and artificial intelligence-supported instructional frameworks, the traditional paradigms of language education must be reevaluated and reconfigured. In fact, recent scholarship has emphasized that intelligent technologies can fundamentally reshape learning environments by enabling adaptive instruction, learner analytics, and personalized learning pathways that promote deeper academic engagement (Siemens & Long, 2011). Against this backdrop, the present course adopts an integrated pedagogical model that harnesses the affordances of intelligent technologies to optimize instructional processes, diversify learning pathways, and elevate students' academic reading, writing, and research literacy. The following sections outline the major components of this reform and delineate the specific measures implemented to foster autonomous learning, develop practical academic skills, and build a robust assessment-feedback system capable of sustaining long-term academic development.

Fostering Autonomous Learning through Digital-Intelligence Tools

Autonomous learning forms the intellectual foundation for sustained academic development, as it equips learners with the ability to navigate complex scholarly environments with self-awareness, strategic judgment, and sustained motivation. Within the context of Academic English, autonomy encompasses deliberate goal setting, strategic planning, iterative self-assessment, and the capacity to make informed decisions regarding learning resources and methodologies. Recognizing the multifaceted nature of autonomy, this course integrates digital-intelligence-supported interventions aimed at cultivating learners' metacognitive awareness, enhancing their decision-making agency, and promoting a shift from passive reception to active, inquiry-driven knowledge construction.

A core mechanism for fostering autonomy is the design of individualized learning plans informed by diagnostic learning analytics. Platforms such as Zhihuishu and the USST Ubiquitous Learning Platform collect and analyze a wealth of data regarding student learning behaviors, including reading engagement, vocabulary acquisition patterns, submission timelines, and prior performance trends. This data enables the generation of personalized recommendations that align with students' proficiency levels, academic interests, and learning needs. Recommended resources may include specialized modules targeting academic vocabulary, micro-lectures on analytical reading strategies, or adaptive exercises designed to address recurring syntactic or stylistic issues observed in student writing. At the commencement of each semester, students are encouraged to create comprehensive autonomous learning blueprints that articulate learning objectives, study milestones, time allocations, and self-monitoring strategies. Instructors provide regular review and targeted guidance on these plans, ensuring that students engage in deliberate, structured learning while retaining the flexibility to adjust their approaches based on feedback and self-reflection. Over time, this process facilitates the development of students' intrinsic motivation and self-regulation, key qualities for academic success in higher education and beyond.

Learner autonomy is further strengthened through the integration of a collaborative digital discussion environment. The "Academic English Reading and Writing Discussion Forum" functions as a virtual scholarly community where students engage in asynchronous academic dialogue, analyze rhetorical features, critique argumentation structures, and respond to thought-provoking prompts. Such interactions not only enable the exchange of diverse perspectives but also foster evidence-based reasoning, rhetorical precision, and scholarly etiquette. By participating in these discussions, students gradually internalize the norms and conventions of academic discourse, acquiring both cognitive and socio-cultural competencies that extend beyond linguistic proficiency. The forum also encourages peer learning, allowing students to refine their analytical and evaluative skills by observing, responding to, and synthesizing the contributions of others. In this sense, autonomous learning is framed not as isolated individual work but as a socially mediated, technology-supported process that combines independence with community engagement.

The use of real-time learning analytics ensures that autonomy is continuously scaffolded, rather than leaving learners to navigate challenges unassisted. Learning analytics track engagement metrics, submission

punctuality, reading depth, and task accuracy, enabling instructors to identify at-risk students early and to provide adaptive support. Automated reminders, supplemental materials, and personalized intervention strategies maintain students' learning momentum, prevent stagnation, and enhance accountability. This feedback loop exemplifies a model of guided autonomy, where learners are empowered to direct their own studies within a framework that provides both structure and responsive support.

Developing Practical Academic Skills through Digital-Enhanced Training

Developing practical academic skills constitutes a second major dimension of this pedagogical reform. True academic literacy extends beyond language proficiency to include the ability to navigate scholarly literature, critically evaluate research methods, and produce rigorous, original academic writing. Digital-intelligence technologies create a learning environment where these skills can be cultivated systematically, allowing students to interact with authentic academic materials, engage in data-supported writing practices, and develop research-oriented thinking in alignment with international academic standards.

A foundational component of skills development is the cultivation of advanced reading and literature retrieval competencies. Zhihuishu and the Ubiquitous Learning Platform provide students with extensive access to a collection of academic resources, including foundational disciplinary texts, cutting-edge research articles, and specialized databases in engineering, science, and technology domains. Structured pre-class reading tasks guide students to engage deeply with these materials, emphasizing strategies such as identifying key hypotheses, evaluating research designs, comparing methodological approaches, and discerning theoretical and empirical contributions. The requirement to produce analytical reading notes, which are subsequently shared and discussed on the digital platform, encourages reflection, peer critique, and collaborative knowledge construction. Through repeated engagement, students develop the ability to synthesize information across multiple sources, recognize disciplinary conventions, and cultivate critical thinking habits essential for independent scholarly inquiry. To further enhance analytical proficiency, the course incorporates advanced text-analysis technologies, including tools capable of identifying lexical clusters, thematic structures, discourse markers, and rhetorical patterns. Such tools enable students to systematically analyze complex academic texts, recognize argumentation strategies, and understand the organization of scholarly reasoning. By practicing with these tools, learners acquire a nuanced understanding of genre-specific conventions, improve their ability to evaluate the quality and validity of research findings, and develop a foundation for informed writing and methodological critique.

Complementing reading and analysis, the course emphasizes structured academic writing training. Drawing on internationally recognized models such as the IMRaD framework, students are guided in constructing clear, logically coherent introductions, detailing methods with precision, presenting results analytically, and developing discussions that situate findings within broader scholarly debates. Real-time digital writing assistants provide feedback on structural coherence, linguistic accuracy, rhetorical clarity, and argumentation effectiveness. This iterative process encourages students to produce multiple drafts, reflecting the authentic workflow of scholarly authorship and reinforcing habits of meticulous revision and reflective writing.

The instruction also integrates rigorous training in academic norms and ethical practices. Students learn citation conventions, including APA and MLA standards, proper paraphrasing techniques, and accurate reference management. AI-supported writing evaluation tools automatically identify inconsistencies in formatting, citation errors, and potential ethical lapses, providing immediate corrective guidance. In combination with explicit instruction on academic integrity, intellectual property, and plagiarism avoidance, this approach ensures that students internalize the ethical and professional responsibilities essential for credible scholarly practice.

Enhancing Assessment and Feedback Mechanisms to Support Continuous Improvement

Assessment in this course functions as both a measurement instrument and a pedagogical tool, designed to guide learners toward increasingly sophisticated academic competence. Through the integration of digital technologies, assessment processes become adaptive, continuous, and multidimensional, allowing instructors to gather actionable insights while simultaneously fostering student self-regulation and reflective practice. Recent

studies have demonstrated that technology-enhanced assessment can significantly improve the precision of feedback, strengthen learners' metacognitive engagement, and promote sustained academic development (Ifenthaler & Yau, 2020).

Formative assessments are embedded throughout the semester and encompass tasks such as analytical reading quizzes, structured writing exercises, citation accuracy tests, and reflective self-assessments. These low-stakes assessments generate rich learning analytics, enabling students to monitor their own progress, identify strengths and weaknesses, and adjust study strategies proactively. Instructors utilize these data to provide targeted feedback, adapt learning activities, and implement personalized support measures. This iterative approach fosters a culture of continuous improvement, ensuring that students remain actively engaged in self-directed learning while maintaining high levels of academic rigor.

Summative assessments offer comprehensive evaluation of students' mastery of academic English and research-related competencies. Tasks include the production of full-length academic papers, oral presentations simulating conference-style reporting, and integrative reading-to-writing assignments that test students' ability to synthesize knowledge from multiple sources. Detailed written feedback provided post-assessment outlines both commendable achievements and areas for further improvement, accompanied by specific recommendations for skill development. Automated responses provided by generative chatbots are regarded as a major advantage, as they support individualized learning while reducing the burden on instructors (Farrokhnia et al., 2023). This individualized guidance ensures that students can continue to refine analytical, writing, and communication skills beyond the course itself, laying the groundwork for success in subsequent scholarly activities.

The combination of formative and summative assessment forms a cohesive evaluation ecosystem that balances measurement with instruction, enabling both accountability and developmental support. By leveraging data analytics, personalized feedback, and diverse assessment modalities, the course ensures that students receive comprehensive, actionable, and developmentally aligned guidance that cultivates their abilities as independent, reflective, and ethically responsible scholars.

IV. Application Outcomes and Innovative Features

The digital-intelligence reform of the "Academic English Reading and Writing" course has not only optimized the instructional model but also significantly enhanced students' academic English competence while promoting a broader sharing of academic resources across institutions. To further strengthen students' academic communication skills, the course adopts a blended learning model characterized as "pre-class online learning—interactive in-class discussion—post-class human-machine collaboration." In the pre-class stage, students engage in self-guided learning through digital platforms, accessing academic materials tailored to their needs. During class sessions, students participate in structured group discussions and oral presentations that deepen their understanding of academic writing conventions and critical reading strategies. In the post-class phase, learners utilize AI-assisted writing tools to refine their drafts, receiving immediate, personalized feedback that supports iterative improvement and targeted skill development.

A notable innovation of the course is the integration of a fully English, virtual simulation of an international academic conference. Through this immersive environment, students rehearse academic presentations, respond to simulated audience questions, and engage in scholarly exchanges that closely mirror real academic settings. This experiential learning component is designed to cultivate students' confidence, fluency, and professional communication skills, thereby preparing them to participate effectively in global academic forums.

The course also incorporates AI-driven literature recommendation systems and automated writing evaluation tools, which significantly enhance students' abilities in literature retrieval, source evaluation, and academic composition. By guiding students to identify relevant research, interpret scholarly arguments, and apply academic conventions, these tools support the development of higher-order academic literacy. Combined with a system of both formative and summative assessments, the course ensures that students receive accurate diagnostic

feedback and individualized support, facilitating continuous and measurable improvement in academic performance. Collectively, these pedagogical innovations aim to create a comprehensive, interactive, and personalized learning ecosystem that empowers students to present their academic work confidently on the global stage while advancing their overall academic English proficiency.

The digital-intelligence–driven reform is expected to yield substantial improvements across multiple dimensions. Foremost, students' academic English competence is projected to improve significantly as they gain the ability to independently produce research papers that meet international academic standards and present their findings confidently in simulated conference environments. Their capacity to engage with global academic communities will thus be markedly strengthened. Moreover, the completion rate for autonomous learning tasks is anticipated to reach approximately 97%, indicating high levels of student engagement and intrinsic motivation fostered by the flexible, technology-enhanced learning environment. From the instructional perspective, teaching efficiency is likewise expected to improve dramatically. AI-assisted grading tools can reduce teachers' workload by nearly 50%, allowing instructors to focus more on providing qualitative feedback and individualized guidance. Real-time analytics also enable instructors to track each student's learning trajectory with precision, intervene promptly when difficulties arise, and support students in adjusting their learning strategies effectively. These expected outcomes not only contribute to the holistic development of students' academic abilities but also demonstrate the potential scalability of this instructional model. The course has already achieved remarkable dissemination effects. Currently, it has been adopted by 9 institutions, with participation extending to 53 partner schools. A total of 8,802 students have enrolled in the course, generating over 100,000 instances of online interaction. This extensive engagement has substantially promoted the sharing of academic resources and enhanced the overall quality of Academic English instruction. As a pioneering example of intelligent academic English pedagogy, this model provides valuable insights and a replicable framework for other higher education institutions seeking to modernize their approaches to academic English teaching.

V. CONCLUSION

The digital-intelligence reform of the "Academic English Reading and Writing" course demonstrates how technology-enhanced pedagogy can substantially reshape the teaching and learning of academic English in the new era. Through the integration of AI-driven learning platforms, data-informed instructional design, and immersive virtual academic scenarios, the course has successfully built a dynamic, interactive, and learner-centered environment that supports both linguistic development and academic literacy. The blended model of pre-class online learning, in-class discussion and presentation, and post-class human–AI interaction has not only diversified instructional pathways but also strengthened students' autonomy, engagement, and problem-solving capacity in academic contexts. The reform has also proven effective in significantly enhancing students' academic English competencies. Students are now better equipped to conduct literature searches, engage in critical reading, and produce academic writing that meets international scholarly standards. The integration of AI feedback tools and formative assessments ensures individualized learning support, enabling students to refine their writing in a continuous, data-supported manner. Meanwhile, the adoption of full-English virtual academic conference simulations provides an authentic environment for students to practice academic presentation and communication, helping them align with global academic norms.

In sum, the reform of the "Academic English Reading and Writing" course illustrates a promising pathway for integrating digital-intelligence technologies into higher education. By combining pedagogical innovation with intelligent support systems, the course establishes an adaptable and future-oriented instructional model that not only enhances students' academic English proficiency but also fosters their capacity for global scholarly communication. This experience provides valuable insights for the further modernization of academic English teaching and offers a replicable framework for other institutions aiming to cultivate internationally competent learners in the digital age.

REFERENCES

[1] Gurney, L. (2016). Challenges for developing EAP practice in anglophone contexts in *Multidisciplinary research perspectives in education: Shared experiences from Australia and China*. Eds. I. Liyanage and B. Nima (Rotterdam: SensePublishers), 7–16.

[2] Yunita, R., and Pratiwi, N. (2017). Developing English program for elementary school teacher education students. *Int. J. Learn*, 3, 176–183. doi: 10.18178/IJLT.3.3.176-183

[3] Hyland, K. (2019). *Second Language Writing*. Cambridge University Press.

[4] Kharchenko, N., Shvardak, M., Shelestova, L., & Trubacheva, S. (2024). Analysis of the effectiveness of technology integration (interactive whiteboards, online platforms, etc) in modern education. *Brazilian Journal of Education, Technology and Society*, 17(1), 65-72.

[5] Binu, P. M. (2024). Affordances and Challenges of Integrating Artificial Intelligence into English Language Education: A Critical Analysis. *English Scholarship Beyond Borders* 10(1), 34-51.

[6] Siemens, G., & Long, P. (2011). Penetrating the fog: Analytics in learning and education. *EDUCAUSE Review*, 46(5), 30-40.

[7] Ifenthaler, D., & Yau, J. Y.-K. (2020). Utilising learning analytics for study success: Reflections on current empirical findings. *Research and Practice in Technology Enhanced Learning, 15*(1), 1-13.

[8] Farrokhnia, M., Banihashem, S. K., Noroozi, O., & Wals, A. (2024). A SWOT analysis of ChatGPT: Implications for educational practice and research. *Innovations in Education and Teaching International*, 61(3), 460-474. https://doi.org/10.1080/14703297.2023.2195846