

Data-Driven Practical Approaches to Integrating Teaching, Learning, and Assessment in English

Zekai Guo, Yan Kou, Yuhan Xu, Hailin Zhang, Meng Cui*

School of Teacher Education, Guangdong University of Education, Guangzhou ,510303, China

*Corresponding author: Meng Cui, mengcui@m.scnu.edu.cn

Copyright: 2025 Author(s). This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY-NC 4.0), permitting distribution and reproduction in any medium, provided the original author and source are credited, and explicitly prohibiting its use for commercial purposes.

Abstract: With the in-depth development of big data technology in the field of education, data-driven integration of teaching, learning, and assessment has become a mainstream pedagogical paradigm. The Compulsory Education English Curriculum Standards (2022 Edition) explicitly proposes the integrated design concept of "teaching–learning–assessment," emphasizing that assessment should permeate the entire teaching process to promote the cultivation of core competencies. However, current junior high school English teaching still faces issues such as disconnection between teaching objectives and assessment, reliance on experiential judgment in learning analytics, lagging assessment feedback, and imbalance between technological application and educational value. Based on this, this study utilizes the Ekwing intelligent platform as a technical support to construct a data-driven integrated "teaching–learning–assessment" learning model. Through three major strategies—anchoring teaching objectives guided by curriculum standards, reconstructing the teaching ecology empowered by the intelligent platform, and establishing a cyclical data-driven teaching–learning–assessment system—the study breaks down the barriers between theory and practice. It constructs a practical pathway for data-driven integrated teaching–learning–assessment to empower the cultivation of core competencies and the enhancement of English learning ability, aiming to provide practical references for promoting the digital transformation of English teaching and the efficient transformation of traditional classrooms.

Keywords: Integration of Teaching; Learning; and Assessment; Data-Driven; Junior High School English; Core Competencies

Published: Nov 3, 2025

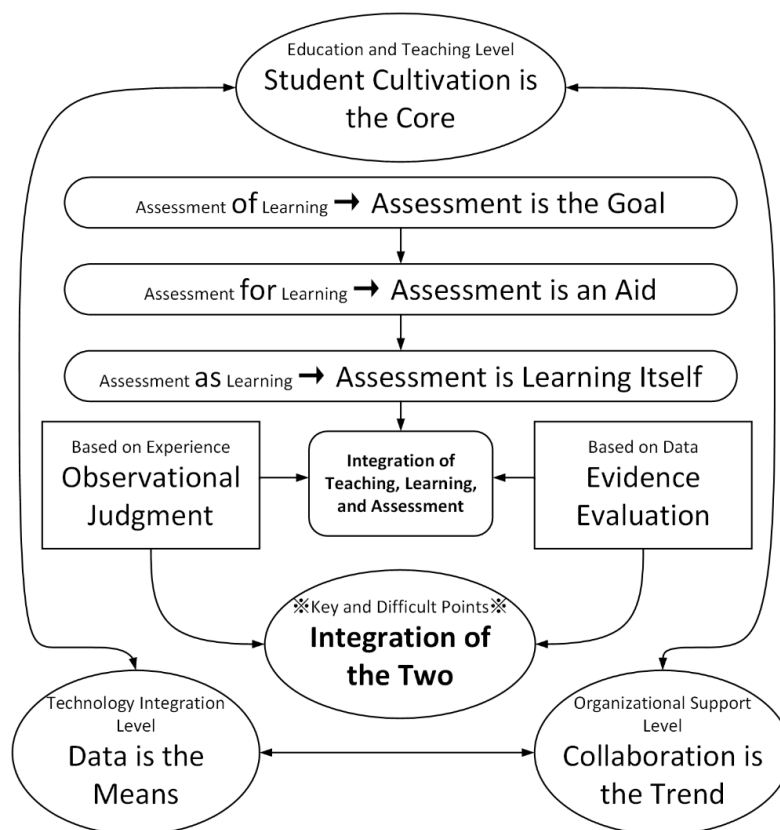
DOI: <https://doi.org/10.62177/jetp.v2i4.773>

1.Introduction

Cultivating students' disciplinary core competencies is the central goal of deepening curriculum reform. As teaching, learning, and assessment share the common essence of developing students' disciplinary core competencies^[1], promoting the integrated design of teaching, learning, and assessment is a key pathway to achieving this goal. The Compulsory Education Curriculum Standards (2022 Edition) explicitly states the need to "strengthen the alignment among assessment, curriculum standards, and teaching, promote the organic connection of 'teaching–learning–assessment,' and emphasize conducting assessment alongside the teaching process." The integration of "teaching–learning–assessment" is a synergistic process involving simultaneous learning, teaching, and assessment. Specifically, it refers to the process where teachers and students integrate assessment into the entirety of teaching and learning through visible learning evidence while completing assessment tasks. They infer the effectiveness of teaching and learning based on assessment evidence, engage in continuous reflection to improve learning

plans, and present these plans in an understandable manner. The new curriculum standards' emphasis on students' self-evaluation and self-reflection abilities, and on guiding students to reasonably use assessment results to improve learning, signifies a shift in educational assessment from "assessment of learning" to "assessment for learning" and "assessment as learning." This marks a profound transformation in educational assessment philosophy—from focusing on "assessment of learning" to placing greater emphasis on "assessment for learning" and "assessment as learning"—highlighting the core concept that "assessment promotes learning"^[2]. The effective integration of assessment and its resonance with teaching practice have become the cornerstone for realizing disciplinary education.

Figure 1 The Integration of Teaching-Learning-Assessment



However, in the traditional educational assessment system, learner evaluation often combines formative and summative assessments, suffering from issues such as singular assessment content and methods. With the increasing richness of collectible learner process data, traditional educational assessment is transitioning towards big data-driven scientific evaluation. The deep integration of big data—encompassing data theory, tool theory, and methodology—with teaching has reshaped the "teaching" and "learning" activities of teachers and students, prompting a shift in the teaching paradigm from "experience-based" to "data-driven": teaching content advances from "disciplinary knowledge" to "individual wisdom"; teaching methods move from "standardized instruction" to "embodied experience"; and teaching evaluation transitions from "observational judgment" to "evidence-based evaluation"^[3]. The essence of the consistency among teaching, learning, and assessment lies in breaking through the traditional isolation and separation of teaching and assessment, ensuring that assessment is no longer superimposed upon or detached from teaching but is embedded within it, becoming an organic component of teaching. The operational mechanism of "data-driven" teaching involves multilateral interactions among teachers, students, teaching media, and content centered around teaching big data^[4]. The Compulsory Education English Curriculum Standards (2022 Edition) also encourages teachers to innovatively use digital technologies and online platforms to support personalized learning needs. Thus, advancing the integrated design of teaching, learning, and assessment in depth is inseparable from the empowerment of modern information technology.

In this context, English intelligent education platforms represented by "Ekwing," with their accompanying assessment mechanisms that collect, analyze data, and generate feedback in real-time, have become typical examples of data-driven

integration of teaching, learning, and assessment, facilitating the implementation of core competencies. Consequently, refining the practical pathway for "data-driven integration of teaching, learning, and assessment" based on intelligent platforms and big data is not only an inevitable requirement to respond to the core demands of curriculum reform and the transformation of assessment concepts but also a key measure for enhancing the effectiveness of English teaching and implementing the new curriculum standards.

2. Current Situation and Problems

2.1 Disconnection Between Teaching Objectives and Assessment Criteria

A prevalent issue in current junior high school English classrooms is the two-dimensional separation between "objectives" and "assessment." In teaching practice, most teachers have not yet deeply understood the educational function of assessment. Their goals for cultivating students' abilities remain unclear, and instruction is still largely oriented towards knowledge transmission—for instance, emphasizing grammatical knowledge while neglecting language proficiency^[5]. Classroom assessment lacks an intrinsic connection with educational goals, and there is a failure to establish assessment criteria based on teaching objectives. This leads to a frequent disconnect between teaching, student learning, and student assessment. Student assessment is often treated as an isolated segment rather than being effectively integrated into the teaching process.

2.2 Experience-Based Dependency in Learning Analytics

In traditional classroom teaching, teachers' judgments of student learning status mostly rely on fragmented information such as classroom observation, question-and-answer sessions, and homework correction. This improvisational assessment, based on personal experience, is highly subjective and inefficient. It often merely judges the correctness of learning outcomes without accurately identifying individual student differences, pinpointing learning problems, or enabling timely adjustments to teaching strategies. Consequently, it lacks effective guidance for student learning itself, making it difficult to achieve truly personalized learning support, which in turn hampers the improvement of teaching effectiveness^[6].

2.3 Lagging and Monotonous Assessment Feedback

Most teachers often compress assessment into a "summary segment" at the end of the class to complete pre-set teaching steps smoothly, lacking awareness of "teaching–learning–assessment" as an integrated whole^[7]. There is an over-reliance on summative assessment and a neglect of process data in evaluation. This results in students passively receiving assessment results without developing the initiative for self-adjustment. This phenomenon prevents teaching effectiveness from reaching its optimal state, fails to fully stimulate students' learning motivation and creativity, and makes it challenging for teachers to establish effective interaction and feedback mechanisms in practice. It hinders teachers from adjusting teaching strategies promptly based on student learning status and assessment feedback, and likewise impedes students from using feedback to adjust their learning strategies in a timely manner, ultimately leading to a situation of "teaching without assessing" or "assessing without improving."

2.4 Imbalance Between Technological Application and Educational Value

The application of digital technology in English classrooms often remains at a superficial level, such as displaying slides or using question bank drills. Although some teachers introduce intelligent platforms into their lessons, they are used merely for assigning homework or listening exercises. These standardized online resources are difficult to adapt to students' diverse cognitive styles and varying paces of competency development. They fail to meet personalized learning needs and do not fully leverage the potential for real-time, data-driven regulation of the English classroom. As a result, the effectiveness of English teaching cannot be optimized, students' learning enthusiasm and creativity are not fully engaged, and teachers struggle to form effective interactive and feedback mechanisms in their teaching practice.

3. Value Demonstration of Data-Driven Integration of "Teaching-Learning-Assessment"

3.1 Enriching the Teaching Evaluation Paradigm and Achieving Diverse Evaluation Standards

A teaching model is a relatively stable structural framework and activity procedure for teaching activities established under the guidance of specific teaching theories or philosophies. Currently, China's education field exhibits diverse educational models, including self-study-tutoring models, inquiry-based teaching models, exemplary teaching models, and Butler's

"Seven Segments" teaching model, among others^[8]. Junior high school students are in a special developmental period of adolescence, with relatively high brain plasticity, strong self-awareness, and cognitive learning abilities. Traditional teaching models lack diverse evaluation paradigms and rely solely on post-lesson test scores as evaluation criteria, which severely stifles students' individual development and hinders the goal of "holistic education." Leveraging its smart classroom functions, the Ekwing platform collects students' learning data in real-time. By analyzing metrics such as student engagement rate (e.g., "heads-up" rate), micro-expression analysis, and speech emotion analysis, it enriches the forms of summative assessment and promotes the transformation of summative evaluation from a single written score standard to multidimensional evaluation criteria. Simultaneously, teachers can assign pre-class preview tasks to achieve precise learning analytics for students and obtain diagnostic assessment data.

3.2 Countering Personal Empiricism and Boosting Teacher Team Development

In teaching activities, teachers, as the "gatekeepers" of the teaching process, play a decisive role in controlling teaching information^[9]. However, influenced by variations in teaching ability levels, teachers often tend to rely on personal experience to make subjective judgments about students' learning behaviors, resulting in assessment feedback that is not timely or effective enough^[10]. Through functions like synchronized training, extended practice, and listening/speaking tests, the Ekwing platform provides teachers with comprehensive, chain-linked learning data for each student, effectively mitigating the negative impact of teachers' individual subjective inclinations. Furthermore, teachers can use the Ekwing platform to incorporate digital resources for vocabulary, grammar, listening, and speaking into their lesson preparation, thereby enhancing their classroom teaching quality. Teachers are no longer merely "knowledge transmitters" but become "strategic designers" of the classroom. The introduction of intelligent educational platforms can significantly enhance teachers' technological application skills and digital leadership, cultivate the digital literacy of China's teaching workforce, and lay a solid foundation for building China into a strong power in digital education^[11].

3.3 Creating Multi-Dimensional Student Profiles and Improving Classroom Teaching Quality

In traditional English listening and speaking teaching, teachers find it difficult both to assess the developmental level of the entire class before the lesson and to accurately gauge students' dynamic learning status during the lesson^[12]. By introducing the Ekwing intelligent platform, teachers can uniformly organize students to conduct English listening and speaking training, collect activity data from students' daily practice, perform learning analytics based on data from different students, and create multi-dimensional student profiles. To address pain points such as students' reluctance to speak or poor foundational speaking skills, targeted listening and speaking exercises can be assigned for training, effectively solving problems like students' fear of speaking or inability to speak. For students with relatively better speaking foundations, advanced exercises are provided to help them correct pronunciation and take their oral proficiency to the next level. Meanwhile, Ekwing uses textbooks as its core benchmark, providing different teaching materials for different grades, effectively meeting actual teaching needs and enhancing classroom teaching quality.

4. Implementation Strategies for Data-Driven Integration of "Teaching-Learning-Assessment"

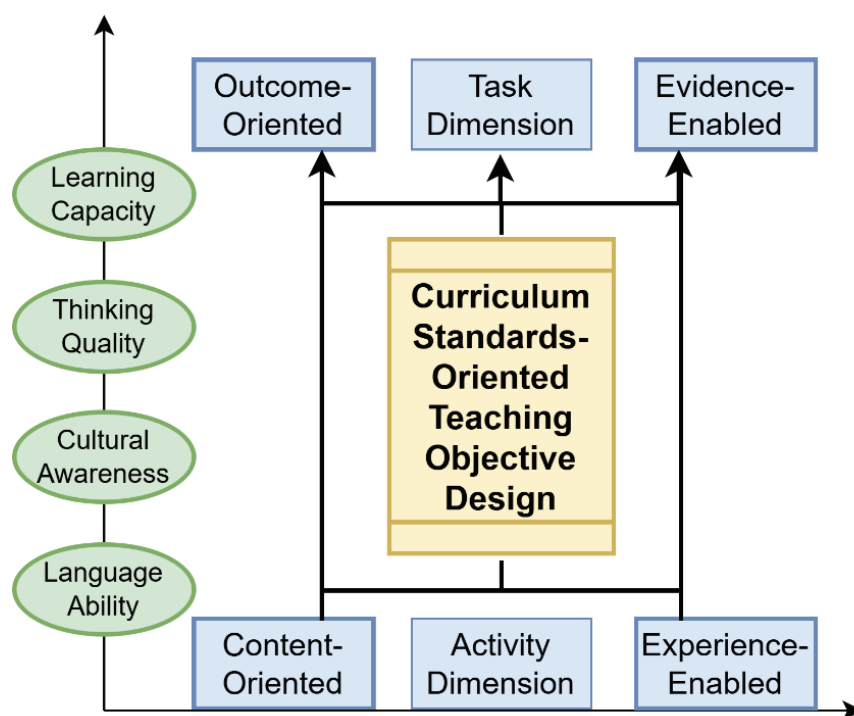
4.1 Curriculum Standards-Oriented Setting of Teaching Objectives

As the core element of integrating teaching, learning, and assessment, teaching objectives possess a three-dimensional guiding function in instruction: guiding learning, guiding teaching, and guiding evaluation. Teaching objectives serve as the action guide for student learning, the implementation blueprint for teacher instruction, and the benchmark for evaluating teaching effectiveness. They are the starting point and ultimate goal of teaching, the soul of instruction, governing the entire teaching process. This implies that when preparing lessons, teachers must first clarify the teaching objectives for that lesson, treating them as the "root" and "source" of effective classroom instruction (i.e., the foundational basis of teaching). If teachers do not deeply contemplate and formulate teaching objectives, instruction becomes like water without a source, losing its direction, and the integration of "teaching-learning-assessment" becomes impossible.

Based on this, teachers must anchor their instructional design in the curriculum standards, use the core competencies of the English subject as the framework, and employ backward design thinking to construct a three-dimensional teaching

objective system^[13]. Specifically, a "begin with the end in mind" backward instructional design approach should be adopted, coordinating the vertical transformation of three-level objectives with the horizontal shift in three-dimensional design: ① On the vertical dimension: Based on the four dimensions of English core competencies—"language ability," "cultural awareness," "thinking quality," and "learning capacity"—and after studying and deconstructing the curriculum standards, systematically plan the academic year teaching objectives. These are then broken down into unit teaching objectives and finally refined into concrete, operable lesson teaching objectives, clearly defining what students need to achieve in each lesson. ② On the horizontal dimension, simultaneously promote a three-dimensional design shift: Learning objective design shifts from "content-oriented" to "result-oriented"; Teaching process design shifts from "activity-focused" to "task-focused"; Learning assessment design shifts from "experience-enabled" to "evidence-enabled"^[14]. This hierarchical, multi-dimensional objective-setting strategy ensures both the value alignment of micro-level teaching practices with macro-level educational goals and provides clear implementation signposts for each stage of teaching, learning, and assessment.

Figure 2 Design of Teaching Objectives



4.2 Teaching Ecology Transformation Driven by Intelligent Educational Platforms

As the core vehicle of the digital transformation in education, intelligent platforms not only provide multimodal means, platforms, and spaces for English teaching but also offer abundant resources and cross-spatiotemporal opportunities for language learning and use. They play a vital supporting role in creating favorable learning contexts, promoting the renewal of educational concepts, and transforming teaching methods^[15]. In the practice of constructing an integrated "teaching-learning-assessment" system, intelligent platforms serve as important tools, demonstrating significant technology-enabled effects in reconstructing the relationships between teaching subjects and reshaping learning practice paradigms.

4.2.1 Reconstructing Teaching Subject Relationships and Realizing Role Evolution

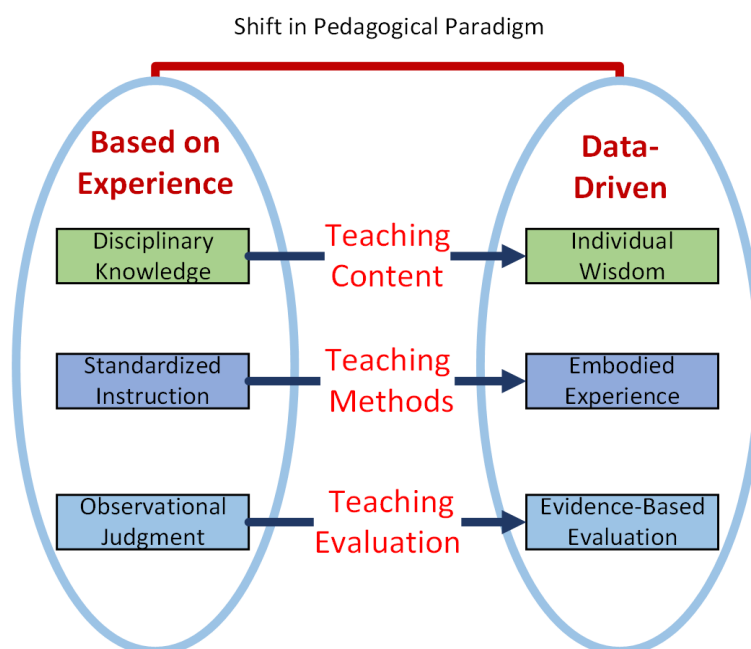
Intelligent platforms represented by "Ekwing" can reshape the production relationships in English education through data interconnection and intelligent analysis technologies. In the English classroom, teachers can leverage the intelligent platform to redefine their roles: by precisely adjusting teaching plans based on the dynamic learning status data from the Ekwing platform, they transition from "knowledge transmitters" to "strategic designers." Students can rely on the platform's personalized learning paths to regain sovereignty over their learning, evolving from "objects of assessment" to "sovereign learners." Assessment can break through the limitations of traditional measurement tools; through instant feedback mechanisms that continuously optimize learning efficacy, it evolves from a "standardized measurement tool" into a "meta-tool

promoting cognitive development" ^[16].

4.2.2 Reshaping Teaching Practice Paradigms and Promoting Goal Transformation

The classroom is the primary venue for implementing the integration of teaching, learning, and assessment. Intelligent platforms drive the transformation towards this integration in classroom teaching through two main pathways: ① Competency-Oriented Unit Objective System: Using the curriculum standards as an anchor, Ekwing can intelligently match textbook content, unit themes, instructional design, and assessment tasks, ensuring the coherent implementation of unit objectives and competency goals within the classroom. ② Data-Driven Assessment Evidence Loop: Functions such as platform-wide collection of behavioral data throughout the learning process and multimodal performance assessment provide a chain of process data evidence for teaching monitoring. This builds a cyclical optimization mechanism of "objective - implementation - analysis - iteration," forms an evidence chain supporting the dynamic adjustment of teaching strategies, and achieves a closed loop ensuring the consistency of teaching, learning, and assessment ^[17]. During lessons, teachers can use the intelligent Ekwing platform to create informatized teaching scenarios and authentic English language application contexts. This promotes the transformation of the English classroom from "textbook knowledge indoctrination" to "core competency cultivation," accomplishes the systematic reconstruction of teaching objectives, processes, and assessment, and ultimately achieves alignment among curriculum standards, textbooks, teaching, and assessment within the English classroom.

Figure 3 Shift in Pedagogical Paradigm



4.3 Reform of the Teaching-Learning-Assessment System Empowered by Educational Data

The consistency of "teaching-learning-assessment" requires that teaching evaluation aligns with teaching objectives. Evaluation activities consist of teaching and learning objectives, along with matching evaluation criteria and tasks, aiming to monitor the effectiveness of teaching and learning ^[18]. Evaluation is not subjective conjecture, nor should it be confined solely to determining whether learning objectives have been met. Instead, it should involve scientific, objective, and fair judgments of student learning evidence based on certain standards. Qualified evaluation should be continuous throughout the teaching and learning processes, serving as an integral part of classroom activities, not just implemented after teaching and learning conclude. Scientific evaluation relies on learning evidence, which originates from students' authentic learning processes and requires collection through various methods and tools ^[19].

The key to evaluation lies in obtaining relevant information from the student learning process and then using this information to support subsequent teaching and learning decisions, thereby helping students achieve the preset teaching objectives. Data-driven teaching-learning-assessment does not seek to replace the measurement of teaching effectiveness with data, but rather uses data as an auxiliary tool for teaching verification, serving the diagnostic and improvement functions of evaluation ^[20].

It is crucial to recognize that the inherent complexity of education makes intuitive data difficult to interpret simplistically. Therefore, we must avoid exaggerating the educational interpretability of data and guard against the cognitive bias of "data supremacy"—we must neither overinterpret the educational explanatory power of data nor allow data to become a rigid evaluation metric. Data should merely provide teachers and students with immediate evaluation evidence to improve teaching and enhance learning. The integration of information technology and data should not diminish teachers' instructional agency. Instead, it should emphasize the deep fusion of professional wisdom and technological tools: teachers must maintain a keen insight into the classroom context, making observational judgments based on experience, while also skillfully using data tools for evidence-based assessment and evaluating teaching effectiveness based on data. They need to preserve experience-guided teaching judgments while developing data literacy to support precise diagnosis. This organic integration of technology and education preserves the humanistic warmth of teaching while enhancing the scientific validity of assessment, ultimately contributing to a healthy developmental ecosystem for the integration of teaching, learning, and assessment.

Conclusion

The value orientation of integrating "teaching–learning–assessment" will induce numerous changes in the relationships among instructional design elements and promote positive effect sizes in classroom teaching. With the rapid advancement and exploration of big data technology in the educational field, data-driven integration of teaching, learning, and assessment is gradually becoming a mainstream pedagogical paradigm in the big data era. When clarifying the approach to this integration, it should be understood that at the educational level, cultivating student is the core, while at the technological integration level, data is the means. The implementation framework for the trinity of "teaching–learning–assessment" must be established based on curriculum standards. Relying on intelligent platforms, an integrated design philosophy of "merging learning with assessment and using assessment to inform teaching" should be adopted. Adhering to the combination of formative and summative assessments, a competency-oriented English curriculum education system featuring diverse participants and multiple methods should be gradually established. This aims to achieve the integration of teaching objectives and learning goals, teaching processes and learning activities, and assessment feedback and learning reflection. Ensuring the effective implementation of "teaching–learning–assessment" consistency in the classroom will realize the goals of using assessment to promote learning, using assessment to improve teaching, and fostering mutual enhancement between teaching and learning.

Funding

This research was supported by the Research on Value-Added Strategies for Enhancing College Students' Higher-Order Thinking Skills Empowered by Artificial Intelligence Driven Knowledge Graphs (Grant No. 2025GZQN28).

Conflict of Interests

The authors declare that there is no conflict of interest regarding the publication of this paper.

Reference

- [1] Wang, Q., & Li, L. (2019). Promoting the integration of teaching, learning, and assessment in English classrooms under the background of core competencies: Significance, theory, and methods. *Curriculum, Teaching Material and Method*, 39(05), 114–120. DOI:10.19877/j.cnki.kejcf.2019.05.016.
- [2] Xie, Y., Lu, Y., Peng, Z., et al. (2024). Exploring the integration of "teaching-learning-assessment" in university courses empowered by knowledge graphs. *China Educational Technology*, (12), 1–7.
- [3] Wei, Y., & Zhang, L. (2022). From "experience-based" to "data-driven": New teaching patterns in the big data era. *Contemporary Educational Science*, (02), 50–56.
- [4] Qian, M., & Jiang, Y. (2023). Data-driven monitoring of undergraduate teaching quality: Basic logic and breakthrough of dilemmas. *Theory and Practice of Education*, 43(15), 51–55.
- [5] Zhang, W. (2025). Exploring the path to constructing an integrated teaching-learning-assessment classroom for high school English under the new curriculum standards. *Campus English*, (01), 9–11.
- [6] [12] Liu, B., Hu, J., Liu, M., et al. (2025). AI-empowered integration of English listening and speaking teaching-learning-assessment: Model, strategies, and effect verification. *China Examinations*, (01), 42–54. DOI:10.19360/j.cnki.11-3303/

g4.2025.01.005.

- [7] Peng, H. (2024). Design and implementation of junior high school English reading teaching based on the integration of 'teaching-learning-assessment' in a digital context. *English Teachers*, 24(21), 119–121+157.
- [8] Zhang, D., Wang, J., Yuan, J., et al. (2021). Technology-empowered transformation and practice of teaching models. *China Educational Technology*, (04), 125–138.
- [9] Xue, X., Zhao, X., & Shen, S. (2022). Breaking through the crisis: Digital resilience of learning subjects and its construction. *e-Education Research*, 43(02), 49–55. DOI:10.13811/j.cnki.eer.2022.02.007.
- [10] Sun, L., & Zhou, L. (2024). The practical logic of integrating generative artificial intelligence into the national smart education platform for primary and secondary schools. *China Educational Technology*, (08), 71–79.
- [11] Fu, G., & Chen, C. (2025). Framework construction and enhancement strategies for teacher educators' digital literacy. *e-Education Research*, 46(07), 116–121+128. DOI:10.13811/j.cnki.eer.2025.07.016.
- [13] Zhang, B., & Yi, M. (2023). Research on digital technology empowering curriculum reform and teaching model innovation: Taking the "English Writing" course as an example. *China Educational Technology*, (12), 106–112+120.
- [14] Zeng, W., & Zhou, Z. (2022). Towards "intelligent learning-oriented assessment": The historical evolution and future prospects of technology-empowered learning assessment. *Curriculum, Teaching Material and Method*, 42(06), 72–80. DOI:10.19877/j.cnki.kcjcf.2022.06.017.
- [15] Gao, T. (2025). Research on the sinking of application services of the national smart education platform for primary and secondary schools. *China Educational Technology*, (07), 63–70.
- [16] Wang, H., Zhang, Y., Lun, H., et al., (2025). Digital modeling and application of online learning metacognitive ability based on multimodal data. *e-Education Research*, (08), 81–89. [2025-08-06]. <https://doi.org/10.13811/j.cnki.eer.2025.08.010>.
- [17] Li, Y., Chen, M., Wang, H., et al. (2020). Research on the evaluation of primary and secondary school teachers' information literacy integrating process data from network learning spaces. *China Educational Technology*, (09), 119–128.
- [18] Zhao, D. (2025). Writing teaching objectives from the perspective of "teaching-learning-assessment" consistency. *Curriculum, Teaching Material and Method*, 45(03), 13–20. DOI:10.19877/j.cnki.kcjcf.2025.03.004.
- [19] Wang, M., & Chen, X. (2025). A systematic model and key processes for data-evidence-based learning design. *e-Education Research*, 46(07), 100–107. DOI:10.13811/j.cnki.eer.2025.07.014.
- [20] Wang, Z., & Dan, J. (2021). How to construct an educational data governance system: Successful experience from Kentucky, USA. *Modern Distance Education Research*, 33(01), 77–86.