

Research on English Vocabulary Teaching Mode Based on Smart Classroom under the New Curriculum Standard

Jijia Cai¹, Wenya Luo²

{2022210516001@stu.cqnu.edu.cn¹, 1754846284@qq.com²}

Chongqing Normal University, No. 37, Daxue City Middle Road, Shapingba District, Chongqing, China

Abstract. The new curriculum standard puts forward new requirements for English subject. Through a review and summary of relevant literature, it has been concluded that the development prospects of smart classrooms are vast and can effectively support the development trends in vocabulary teaching. Based on this, Building an English Vocabulary Teaching Mode with the aim of enhancing students' core competencies in the English subject, accommodating individualized student development, and providing a reference for the promotion and application of smart classroom education.

Keywords: New curriculum standard; Smart Classroom; English vocabulary; Teaching mode

1 Introduction

The size of a student's vocabulary and their ability to use words correctly are crucial indicators of their language proficiency. According to the “Compulsory Education English Curriculum Standards (2022 Edition)”^[1], the overall goal of the English curriculum at the basic education stage is to cultivate students' comprehensive language skills. Compared with the 2011 version of the curriculum standard, it is found that the changes in vocabulary teaching under the new standard are mainly reflected in two points: first, the division of compulsory education stages has been reduced from the original 5 levels to 3, and second, the vocabulary requirement has increased from 1600 to 1800 words. Additionally, there is an emphasis on promoting the deep integration of information technology with English teaching. Based on the “Internet+” mindset and the new generation of information technologies such as big data and cloud computing, smart classrooms have broken free from the constraints of traditional education. They are founded on the characteristics and actual needs of students, utilize rich resources and learning support, employ diverse strategies and learning pathways, and are guided by individualized, multifaceted developmental assessments^[2]. In the realm of vocabulary teaching, smart classrooms have the potential to comprehensively enhance students' core competencies, fully realize the maximization of students' individuality and abilities.

2 Literature Review on Relevant Studies

2.1 The current research status of vocabulary teaching in China

To investigate the research outcomes of English vocabulary teaching in China over the past several years, this article conducted an advanced search on CNKI using “English vocabulary teaching” as the main keyword. The time frame was set for the past decade, from 2013 to the present year. A total of 187 core journal articles were retrieved, and a visual analysis was performed on all the data results in Figure 1. It was observed that the overall publication volume exhibited a slightly declining but fluctuating trend, indicating a continuous production of research outcomes in this field, which is maturing alongside technological developments.

Data source: Total number of documents: 187 articles; Retrieval conditions: (subject% = English vocabulary teaching 'or title% = English vocabulary teaching)AND (Between(2013,2023)AND (SCI received. Journal = 'Y')OR(EI Journal = 'Y')OR(core journal = 'Y')OR(CSSCI journal = 'Y')OR(CSCD Journal = 'Y')); Search scope: journal.

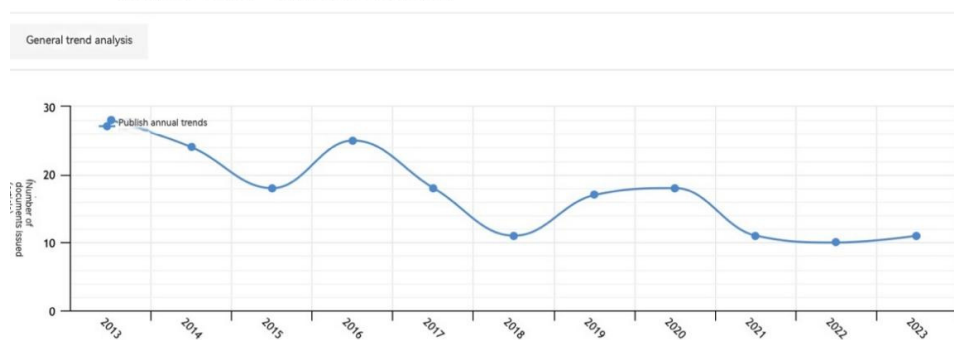


Fig. 1. Research status of vocabulary teaching in China.

Frequency analysis of all keywords, with a cutoff frequency of 7 or more, was conducted to generate a co-occurrence network diagram in Figure 2. This illustrates the broad distribution of topics in existing literature and the diversity of thematic perspectives. It provides initial insights into the academic hotspots and development trends in English vocabulary teaching research in China, primarily manifesting in three aspects: methodology, autonomous learning, and language application.

Education informatization has evolved from 1.0 to 2.0, continually giving rise to new teaching ideologies and methods. These include interactive teaching, situational teaching, micro-lessons, and now, a stronger emphasis on intelligence and personalized education, aiming to comprehensively foster students' core competencies. For instance, Liu Liping (2014) proposed the application of self-directed learning strategies in English vocabulary teaching as an effective approach to address the outdated issues of time-consuming and inefficient vocabulary instruction^[3]. Zhang Liming (2022) highlighted the widespread application of corpus intelligence in the field of smart education^[4]. Li Zhiwei (2023) suggested the comprehensive use of various methods, such as situational teaching and reading instruction, to effectively improve students' ability to flexibly express themselves in English^[5]. Jin Ying (2022) pointed out that English teaching from a cross-cultural perspective has become a focal research topic^[6]. Chang Xiao (2023) argued that ecological English provides learners with a new context for language learning, facilitating their independent exploration and use of new vocabulary^[7].



Fig. 2. Keyword co-occurrence network diagram.

2.2 The current status of English subject application in smart classrooms

In recent years, smart classrooms have experienced rapid development, originating from IBM's "Smarter Planet" strategy in 2008, which introduced new concepts like "smart cities", "smart education", and "smart classrooms." From the perspective of informatization, the development of smart classrooms can be roughly divided into three stages, and we are currently in the Smart Classroom 3.0 era^[8].

Similarly, an advanced search was conducted using "Smart Classroom English" as the theme keyword, covering the period from 2013 to the present. A total of 330 academic journal articles and 46 theses were retrieved. A visual analysis of all academic journals was performed in Figure 3, revealing that research on English education based on smart classrooms began to rapidly rise in 2018, with theses following the same trend. With the release of education policies such as the "Education Informatization 2.0 Action Plan"^[9], smart classroom teaching guided by the new curriculum standards has become increasingly popular, leading to a deep integration of information technology and traditional teaching. It is foreseeable that smart classrooms centered on classrooms, focused on teaching effectiveness, and promoting data interoperability will be widely adopted, enabling the comprehensive implementation of personalized and competency-based education.

Simultaneously adding the keyword "vocabulary", it was found that there is very limited research on vocabulary, with only three academic journal articles available, all of which are focused on universities. Additionally, there are only two theses on this topic. Therefore, the study of English vocabulary teaching models within the context of smart classrooms is of paramount importance.

Data source: Total number of documents: 330; Search conditions: (Topic% = smart classroom English 'or title% =) smart classroom English); Search sco

General trend analysis

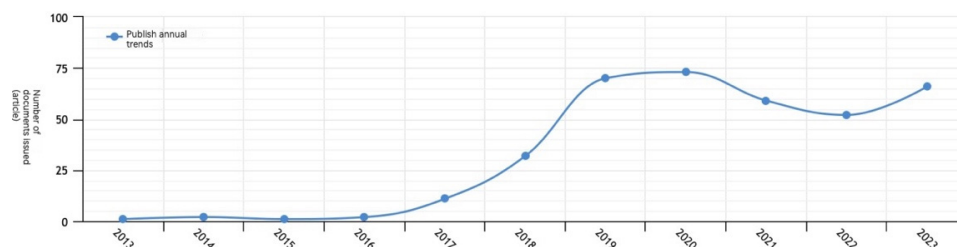


Fig. 3. The current status of English subject application in smart classrooms.

3 Overview of Smart Classroom

Smart classroom is the modern educational system based on mainstream technologies such as 5G mobile communication, big data, artificial intelligence, blockchain, and the Internet of Things (IoT). It serves as a crucial entity driving the digitization and intelligence of education. From an informatization perspective, it is guided by learning theories like constructivism and connectivism, with the goal of promoting the development of students' core competencies. It leverages intelligent information technologies such as artificial intelligence and big data to create intelligent and efficient classrooms. Its aim is to propel innovation in subject-specific smart teaching models, genuinely achieving personalized learning and tailored instruction. It also facilitates the transition from knowledge acquisition to knowledge application, ultimately realizing intelligent development^[8]. The four core characteristics of smart classrooms align with the requirements of the new curriculum standards and cater to the development trends in English vocabulary teaching. They break through the barriers of traditional teaching, making the learning process more diversified.

3.1 Characteristics of smart classrooms

Liu Bangqi (2023) explains that the core characteristics of smart classrooms mainly include technology-driven teaching decision data, instant assessment feedback, three-dimensional communication and interaction, and intelligent resource delivery, with continuous iterations based on these foundations^[10], which shown in Figure 4. Firstly, Technology-Driven Teaching Decision Data: Supported by information technology platforms established by schools, dynamic collection and analysis of students' learning data shift the teaching process from relying on teachers' teaching experience in the past to relying on objective data in teaching. Teachers can make precise teaching decisions based on data analysis, thereby enhancing the effectiveness of instruction. Secondly, Instant Assessment Feedback: Smart classrooms emphasize dynamic formative assessment, which involves timely and effective assessment and feedback on students' learning behaviors and outcomes during the teaching process. This allows teachers and students to adjust their teaching and learning strategies promptly. Thirdly, Three-Dimensional Communication and Interaction: With the help of various new media and technologies, smart

classrooms offer diverse interactive methods, such as video conferences, online discussions, instant messaging, and more. This makes information communication and exchange more convenient and efficient. Lastly, Intelligent Resource Delivery: By analyzing students' learning data and personal characteristics, smart classrooms can intelligently deliver targeted learning materials. This enables real-time and tiered resource delivery, helping students better access and absorb knowledge.

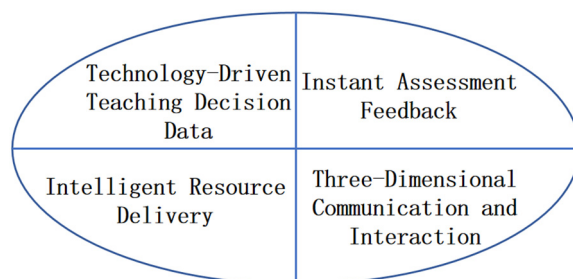


Fig. 4. Smart classroom feature map.

3.2 The Support of Smart Classrooms for Vocabulary Teaching

Resource-rich and personalized learning

By connecting to the internet and digital resources, offer a wealth of personalized vocabulary learning resources and activities. Students can access online dictionaries, vocabulary databases, and more to expand their vocabulary and language application skills. For instance, in vocabulary retention, smart education platforms utilize big data to analyze learners' learning records and performance, creating personalized vocabulary review schedules. The system automatically identifies learners' points of forgetting and provides timely review materials and tasks to help learners reinforce their memory and extend the retention time. Furthermore, the platform monitors students' reviews according to the forgetting curve, employing methods such as concentrated learning in the initial stages, timely reviews, spaced reviews, contextual connections, and various review approaches to assist students in more effectively retaining and consolidating their learned knowledge and information.

Multimedia Interaction and Real-time Feedback

In the teaching process, there is a primary focus on building a learning community, utilizing interpersonal interactions to reduce the burden on students while relieving teachers' workload. Smart classrooms provide interactive features such as electronic whiteboard interactions and interactive book-based games, encouraging students to actively participate in vocabulary learning. Through practical activities and situational simulations, students can better understand and memorize vocabulary, enhancing their language proficiency. The removal of time and space constraints provides students with ample personalized assistance and time, offering broader learning opportunities. Throughout the entire teaching process, the system continuously monitors, analyzes data, and provides feedback to teachers, students, and parents in real-time. This aids students in promptly identifying and correcting errors in vocabulary learning and allows schools and parents to collaborate in improving students' learning outcomes.

4 Model Construction and Assessment Evaluation

Taking the People’s Education Press English textbook for seventh grade as an example, there are a total of 418 vocabulary words in the word list, divided into 12 units. Each unit is taught over the course of 5 lessons. Therefore, following a weekly (5-day) schedule and based on Ebbinghaus’ forgetting curve, students need to learn approximately 8 new words per day, including vocabulary review. The average study duration varies around 30 minutes. Students adjust their independent learning based on their individual circumstances and form learning communities to collectively achieve teaching objectives. Based on this, we establish the English vocabulary teaching model under the framework of smart classrooms. Assessment is carried out through daily group quizzes, weekly quizzes, and bi-monthly comprehensive assessments. The specific implementation process of this teaching model can be understood in three phases: pre-class, in-class, and post-class in Figure 5, elaborating on the roles of teachers and students. In this sense, we construct a truly modern classroom that is teacher-led and student-centered. The teaching environment primarily includes subject teaching tools, tablets, interactive screens, smart educational platforms, digital resources, online interactive tools, and more.

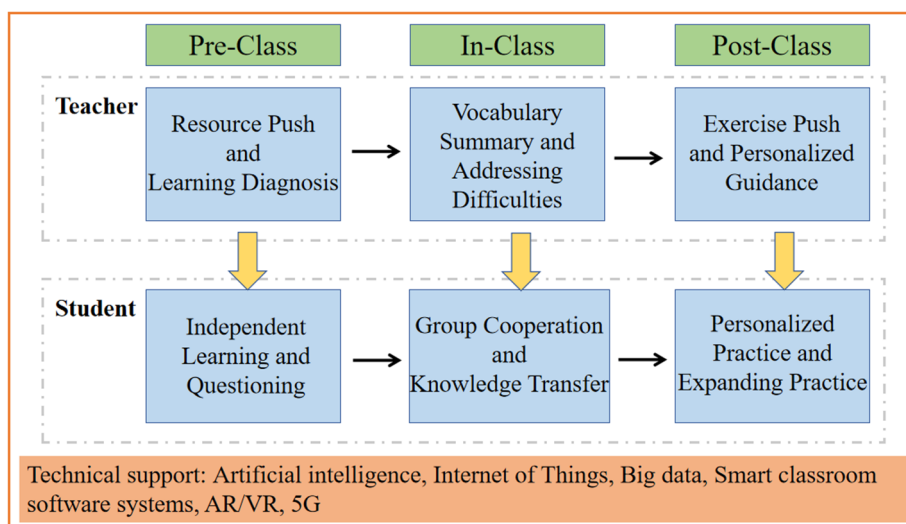


Fig. 5. Teaching model architecture diagram.

4.1 Model construction

Pre-Class (10 minutes)

“Resource Push and Learning Diagnosis” (Teacher): The teacher assigns relevant tasks and publishes introductory materials on the platform, such as courseware, micro-lessons, or video/audio resources. These materials provide practical contexts for vocabulary application, various memory techniques, and learning tools to enhance vocabulary comprehension and retention. Practice content includes gamified questions related to listening, speaking, and spelling. These exercises strengthen listening, speaking, reading, and writing skills through features like speech and text recognition as well as recording capabilities. After students

complete their responses, the system promptly collects student answers and learning data. Based on the diagnostic results provided by the platform, the teacher adjusts teaching content and strategies accordingly.

“Independent Learning and Questioning” (Students): Students independently complete tests on their tablets and identify learning problems based on test results. They engage in online discussions with teachers and classmates concerning learning resources.

In-Class (Last 10 minutes)

The in-class phase primarily utilizes the last 10 minutes of class time to summarize students’ pre-class preparation and interactions through mind maps. It emphasizes key points and allows students to consolidate their knowledge through group cooperation in a lively interactive atmosphere.

“Vocabulary Summary and Addressing Difficulties” (Teacher): Firstly, the teacher uses an interactive screen to create scenarios, explaining challenging or frequently mistaken vocabulary encountered during pre-class preparation, categorizing them by word type. Subsequently, the smart education platform records students’ notes and provides feedback to the teacher. The teacher conducts random checks on student comprehension using flashcards, maintaining excellent control over the classroom. Based on students’ learning data and performance, the teacher offers timely encouragement, guidance, or corrections to help them understand and master vocabulary knowledge.

“Group Cooperation and Knowledge Transfer” (Students): Firstly, students take notes on their tablets, highlight key points, and raise questions and insights through online voting and Q&A sessions to enhance their understanding and consolidation of knowledge. Next, they form learning communities for group cooperation, exploring strategies and techniques for vocabulary learning. They learn from, borrow from, and correct one another, improving the effectiveness of vocabulary learning. Students complete collaborative tasks to enhance their innovation and overall engagement and motivation. Finally, online group discussion areas on the smart teaching platform facilitate discussions and inter-group and intra-group evaluations.

Post-Class (10 minutes)

“Exercise Push and Personalized Guidance” (Teacher): The teacher pushes vocabulary tasks through the platform, such as vocabulary challenges and memory games, allowing students to complete quizzes in a pleasant atmosphere. The teacher utilizes a precise teaching system based on big data analysis to assess students’ vocabulary levels and needs. Personalized digital resources are timely pushed to students, making full use of the collaboration among families, schools, and communities. Learning communities collaborate, interact, and support each other under common learning goals, promoting comprehensive student development.

“Personalized Practice and Expanding Practice” (Students): Students receive timely assessment results and suggestions through online quizzes, speech recognition, and other technologies on their tablets. They adjust their learning strategies accordingly. Each group conducts evaluations to ensure that students complete tasks on time.

4.2 Assessment and evaluation

Goodyear (2015) emphasizes the integration of teaching and learning methods in a “student-centered” learning environment^[11], advocating the full construction of a smart classroom where teachers take the lead while students actively participate. Daily group leaders upload their group members’ learning progress, and weekly and bi-monthly in-class online quizzes based on Ebbinghaus’s forgetting curve theory are conducted, along with activities like group game competitions. This approach gathers authentic data on students’ performance, and the smart classroom’s assessment methods are applied comprehensively, considering individual student situations and applying rewards and penalties across the learning community through comprehensive assessment.

The assessment methods are primarily facilitated through the smart classroom software system, recording the entire teaching and learning process and providing multidimensional and multi-perspective evaluations. The assessment methods encompass various types, including quantitative evaluation of classroom participation, quality assessment of homework completion, stage test evaluations, assessments based on learning behavior data, and evaluations of group cooperation, among others, which shown in Table 1. The specific proportions for each assessment type depend on individual circumstances. These assessment methods prioritize students’ mastery of knowledge, emphasize skill development and holistic growth, facilitate timely issue identification and improvement, enhance teaching effectiveness, offer suitable evaluation methods and feedback mechanisms for each student, and promote personalized development and self-improvement.

Table 1. Assessment and evaluation form.

levelEvaluation method	Evaluate the content
Classroom participation quantitative assessment	Through the smart classroom software system, record each student's class participation each time, including answering questions, presentations, discussions, etc., and quantitatively scoring.
Homework completion quality assessment	Quality evaluation is carried out according to the student's completion of the assignment, including completion time, correct rate, difficulty factor, etc.
Learning behavior data evaluation	By collecting students' learning behavior data, such as learning time, learning content, learning efficiency, etc., the evaluation and analysis of learning behavior are carried out.
Group cooperation evaluation	In the cooperative learning of smart classroom, the cooperation ability and team spirit of group members are evaluated through the evaluation of the cooperation process, cooperation results, cooperation attitude and other aspects of the group.
Periodic test evaluation	Through regular periodic tests, such as unit tests, midterm exams, etc., students' knowledge is evaluated.

5 Conclusion

“Without grammar, we cannot express ourselves effectively, and without vocabulary, we cannot express anything at all.”^[12] The smart classroom is the inevitable choice in today’s era of smart learning and is the result of the integration of quality education and information technology development under the new curriculum standards^[13]. In English, the quantity of vocabulary students master and their proficiency in using vocabulary directly impact their language communication skills. The emergence of smart classrooms has created a dynamic, open, student-centered learning environment, enabling students to adopt more rational learning strategies to control their learning content and improve their self-learning abilities, thus optimizing the teaching process. In conclusion, smart classrooms bring new opportunities and challenges to English vocabulary teaching. We should actively explore and apply smart classroom technology, continuously innovate teaching methods, focus on core competencies in English subjects, enhance students' English learning experience and effectiveness, cultivate talents with high intelligence and creativity, and promote the digital and intelligent development of education.

References

- [1] Ministry of Education of the People's Republic of China.: Compulsory Education English Curriculum Standards. Beijing: Beijing Normal University Press, 25-26 (2022)
- [2] Qiu, Y., Xie, Y., Li, S., et al.: Classroom Transformation Towards the Era of Smart Learning. *Educational Technology Research*, 39(07), 70-76 (2018)
- [3] Liu, L.: Autonomous Learning Strategies and Their Application in English Vocabulary Teaching. *Journal of Inner Mongolia Normal University (Educational Science Edition)*, 27(12), 107-108(2014)
- [4] Zhang, L.: Vocabulary Semantic Pattern Recognition from the Perspective of English Corpora in the Construction of Digital Teaching Resources. *Foreign Languages in China*, 38(06), 140-150(2022)
- [5] Li, Z.: Corpus-Driven English Vocabulary Teaching: Rationale and Application—A Review of "How to Use Corpora in Language Teaching." *China Higher Education Research*, 2023(Z1), 146 (2023)
- [6] Jin, Y.: Research on Food English Teaching in Cross-Cultural Contexts—Review of "Food Industry English." *Food and Machinery*, 38(01), 247-248 (2022)
- [7] Chang, X., & Yu, M.: Integration and Application of Environmental English in English Vocabulary Teaching in an Ecological Environment. *Environmental Engineering*, 41(04), 284 (2023)
- [8] Liu, B. (2019). Development, Platform Architecture, and Application Design of Smart Classrooms: From Smart Classroom 1.0 to Smart Classroom 3.0. *Modern Educational Technology*, 29(03), 18-24.
- [9] Ministry of Education.: Education Informatization 2.0 Action Plan. http://www.moe.gov.cn/srcsite/A16/s3342/201804/t20180425_334188.html (2018)
- [10] Liu, B. Smart Classrooms Leading the Digital Transformation of Teaching: Trends, Features, and Practical Strategies. *Educational Technology Research*, 44(08), 71-79. (2023).
- [11] Victoria, Goodyear, Dean. “I’m a Facilitator of Learning!” Understanding What Teachers and Students Do Within Student-Centered Physical Education Models[J]. *Quest*(2015)
- [12] Wilkins,D.A.Vocabulary Linguistics in Language teaching[M].London (1972)
- [13] Huang, R., Hu, Y., Yang, J., et al.: The Concept and Characteristics of Smart Classrooms. *Open Education Research*, 18(02), 22-27 (2012)